

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	2.6

MAINTENANCE INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
1	April 8, 1992	Technical Information Package (TIP) for Automated Surface Observing System
2	May 15, 1992	Engineering Management Reporting System (EMRS)for the Automated Surface Observing System (ASOS)
3	October 7, 1992	Hygrothermometer Configurations
4	January 22, 1993	Lightning Rod Safety Cover for Wind Sensor Tower
5	April 15, 1993	Paroscientific Model 760-16B Portable Pressure Standard
6	May 3, 1993	Pressure Sensor Maintenance Check
7	August 12, 1993	Setting up the Panasonic KX-P1180 and KX-P2180 Dot Matrix Printers
8	May 5, 1994	Resetting ASOS Pressure Sensors
9	On Hold	
10	June 17, 1994	Calling the ASOS Operations and Monitoring Center (AOMC)
11	July 8, 1994	Correction for the Laser Beam Ceilometer Calibration Procedure
12	July 28, 1994	Alternative Battery Check Procedure for the Liquid Precipitation Accumulation Sensor (LPAS)

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	2.6

MAINTENANCE INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

Number	Date of Issue	Title
13	July 29, 1994	Functional Designations for the Fiber Optic Modem S100-2A3AL1-1
14	October 11, 1994	Time Set for ASOS Every 90 days
15	Delete	Reduction of Hygrothermometer Mirror - Cleaning Period
16	March 31, 1995	Wind Direction Vane and Wind Speed Cup Assembly Skirt Clearance
16	Errata 1 April 27, 1995	Pen-and-Ink the number 16 to Maintenance Note titled "Wind Direction Vane and Wind Speed Cup Assembly Skirt Clearance" Issuance date of March 31, 1995
17	April 27, 1995	Ordering ASOS Site Technical Manual and Changes from NLSC
17	Errata 1	Errata to Ordering ASOS Site Technical December 2, 1996 Manual Changes from NLSC Maintenance Note 17
17	Errata 2	Errata to Maintenance Note 17, " Ordering June 30, 1997 ASOS Site Technical Manual and Changes from the National Logistics Support Center (NLSC)."
18	May 5, 1995	Automated Surface Operating System (ASOS) Spares Kit
18	Errata 1	Automated Surface Operating System (ASOS) Spares Kit Maintenance Note 18.

<i>Issue Date</i>	<i>Org. Code</i>	NATIONAL WEATHER SERVICE	<i>Program</i>	<i>Part</i>	<i>Section</i>
	W/OSO321	Engineering Handbook	EHB-11	02	2.6

MAINTENANCE INDEX - AUTOMATED SURFACE OBSERVING SYSTEM

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
19	September 7, 1995	Setting up the Panasonic KX-P3123 Impact Dot Matrix Printers
20	Draft	Freezing Rain Sensor Field Calibration
21	September 9, 1996	Autobalance Module Threshold Resistor (R5)
22	March 3, 1996	Frozen Wind and Direction Bottles
23	June 4, 1996	Dew Point Sensor Assembly Improvements
24	June 17, 1996	4-Wire to 2-Wire Telephone Circuit Remote for ASOS Equipment
25	In review	Hygrothermometer Dew Point Sensor Mirror and Optical Loop Adjustment Maintenance
26	August 9, 1996	Freezing Rain Sensor Grounds
27	August 23, 1996	Ordering and Installing ASOS Calibration Software
28	September 27, 1996	Safe Operation of ASOS Freezing Rain Sensor
29	October 15, 1996	Accessing the ASOS Technical Information Center Home Page
30	October 17, 1996	Technical Information
31	January 30, 1997	Visibility Sensor Transmitter Optical Detector Functional Check
32	May 8, 1997	Safety Chain for an ASOS Hinged Sensor



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OS0321: BGM

April 8, 1992

TO: All NWS Regional Headquarters, Area Electronics Supervisors, and
Electronics Technicians (EHB-11 Distribution)

FROM: W/OS03 - J. Michael St. Clair *J. M. St. Clair*

SUBJECT: Transmittal Memorandum for Engineering Handbook 11, Issuance 92-2

1. Material Transmitted:

Maintenance Note 1 (Technical Information Package) for Automated Surface
Observing System.

2. Summary:

This issuance contains basic maintenance program information for ASOS.
File this issuance in a new section 2.5 in EHB-11.

3. Effect on Other Instructions:

None.

EHB-11
Issuance 92-2



TECHNICAL INFORMATION PACKAGE
AUTOMATED SURFACE OBSERVING SYSTEM

TABLE OF CONTENTS

SECTION 1	INTRODUCTION 1.1 Purpose 1.2 General 1.3 Installation Responsibilities 1.4 Installation Schedule
SECTION 2	SAFETY GUIDANCE 2.1 Eye Safety 2.2 Voltage Precautions
SECTION 3	MAINTENANCE AND LOGISTICS POLICIES 3.1 Maintenance Policies 3.1.1 Maintenance Responsibilities 3.1.2 On-Site Repairs 3.1.3 Staffing 3.1.4 Maximum Outage Times 3.2 Logistics Policies 3.2.1 Station Spares 3.2.2 Warranty
SECTION 4	DOCUMENTATION 4.1 Equipment Manuals 4.2 Maintenance Schedule 4.3 EMRS Reporting 4.4 Engineering Handbook 1
SECTION 5	TRAINING 5.1 Formal Training 5.2 On-the-job Training
SECTION 6	ACCEPTANCE PROCEDURE 6.1 Installation 6.2 Acceptance
SECTION 7	SYSTEM PERFORMANCE VERIFICATION 7.1 Maintenance Terminal Use 7.2 Performance Verification 7.3 Troubleshooting techniques
SECTION 8	MAINTENANCE AIDS 8.1 Support and Test Equipment 8.2 Remote Maintenance Monitoring
ATTACHMENTS:	A. Acceptance Procedures B. ASOS Operations and Monitoring Center

TECHNICAL INFORMATION PACKAGE AUTOMATED SURFACE OBSERVING SYSTEM

SECTION 1 INTRODUCTION

1.1 Purpose - The purpose of the Automated Surface Observing System (ASOS) technical information package is to provide National Weather Service (NWS) personnel with engineering criteria pertaining to acquisition, installation and subsequent maintenance of NWS field equipment.

1.2 General - The National Weather Service (NWS) warning and forecast mission requires extensive use of electronic equipment for product dissemination, data acquisition and environmental monitoring. The NWS has purchased the ASOS, which collects weather data and provides accurate 24-hour accumulated weather reports to local observers; weather forecasters; airport personnel, including pilots and air traffic controllers; Federal Aviation Administration (FAA) and NWS personnel. The ASOS is a flexible system with a modular construction that allows deployment in a variety of configurations for operation with or without the attendance of an observer. The ASOS provides useful weather information in text, video, and audio format to a variety of users.

1.3 Installation Responsibilities - The contractor will provide facilities engineering services as required in support of the ASOS program. These services include installation, site redesign, structures, supports, utilities, cabling, lightning protection, grounding, and other power sources.

1.4 Installation Schedule - Field deployment of the ASOS began in mid 1991. The currently authorized base program encompasses 245 ASOSs for the NWS, 537 systems for the FAA and 86 systems for the U.S. Navy. The NWS plans to provide systems for nearly all locations which have responsibility for surface aviation observations. A data base or hard copy with the installation schedules has been provided to each NWS regional ASOS focal point. Updates will be provided to the regions by the ASOS program office.

SECTION 2 SAFETY GUIDANCE

2.1 Eye Safety - The CT-12K laser ceilometer is a Class 1 laser device when used within its normal operational conditions. This means that the CT-12K laser ceilometer in a field environment with instrument covers on poses no established biological hazard to humans. The following precautions are to be followed during service and maintenance of the laser ceilometer. Only trained personnel should perform maintenance functions.

The CT-12K uses invisible laser radiation which may harm human eyes. Never look directly into the transmitter with magnifying

glasses or binoculars. When operating, avoid prolonged exposure to the laser beam radiation.

2.2 Voltage Precautions - Maintenance personnel must observe all safety regulations at all times when servicing or repairing the ASOS. Do not replace components while the equipment is energized. Under certain conditions dangerous potentials may exist when power has been turned off. Be sure to check if batteries are in the circuit or charges are retained by capacitors. To avoid injury, always remove power and discharge and ground a circuit before touching it.

Because of the danger of introducing hazards, do not substitute parts or perform any unauthorized modifications to the equipment.

Refer to the ASOS site manuals for specific safety information and precautions before repairing the ASOS.

SECTION 3 **MAINTENANCE AND LOGISTICS POLICIES**

3.1 Maintenance Policies - NWS field personnel will maintain ASOS sites sponsored by both the NWS and FAA. These sites are to be maintained without distinction between an FAA or NWS site.

3.1.1 Maintenance Responsibilities - Upon acceptance of ASOS, maintenance and support will be provided by the ASOS Operations and Monitoring Center (AOMC), Regional ASOS Specialist (RAS), and ASOS Electronics Technicians (ET).

The AOMC monitors ASOS operations and contacts field offices when ASOS needs corrective maintenance. See Attachment B.

The RAS provides regional coordination for the ASOS program and assistance for field maintenance staff.

The ASOS ETs are responsible for maintenance and repair of ASOS in their assigned maintenance area. The ET, after being informed of an outage, should proceed with the maintenance or repair action according to the assigned priority.

3.1.2 On-Site Repairs - The ASOS ET, after being notified of an ASOS failure, can dial the ASOS and check its status and perform various maintenance functions without interrupting operations. In some instances this action could eliminate a visit to the site by reviewing and correcting the problem via a laptop computer.

The basic field repair will be to isolate the fault to a particular Field Replaceable Unit (FRU) by using diagnostics available in the ASOS. After isolating the fault, the ET will repair the FRU or replace it from the spares provided for on-site replacement and check for proper system operation. Failed repairable FRUs must be returned to NRC for repair.

3.1.3 Staffing - The NWS maintenance staff for the ASOS will consist of 46 ETs who will specialize in ASOS maintenance most of their time. Other technicians will back up the ASOS technicians. The ASOS ETs will be based at locations chosen by the regions. Each ET will service approximately 20 sites, traveling to the sites via a provided van. If the NWS assumes responsibility for maintaining the FM ground-to-air radios used with ASOS, more staff will be provided.

3.1.4 Maximum Outage Times - The ASOS equipment shall be restored to full operation within the times shown in the table below, with a consumer risk of 5 percent or less.

Priority 1. These are safety-related failures. They involve the following sensors and components.

- Pressure
- Wind speed and direction
- Hygrothermometer
- Visibility
- Ceilometer
- Data collection platform
- Acquisition control unit
- Freezing rain occurrence (during periods when freezing rain can occur)

Priority 2. These are failures affecting flight operations and forecasting. They involve the following sensors and components.

- Liquid precipitation accumulation
- Snow depth
- Frozen precipitation water equivalent
- Other forms of present weather
- Operator interface devices (OID)*
- Video display units
- Controller video displays (CVD)**

* If no OID is working, the failure is priority 1.

** If fewer than half of the available CVDs are working, the failure is priority 1.

Priority 3. These are low priority failures. They involve the following sensors and components.

- Snow depth (during periods when snow cannot occur)
- Freezing rain occurrence (during periods when freezing rain cannot occur)
- Sunshine switch
- Printer

Maximum Outage Times

TYPE AIRPORT	PRIORITY	OUTAGE TIME
MAJOR HUB *	1	12 hours
	2	24 hours
	3	72 hours
OTHER TOWERED	1	24 hours
	2	36 hours
	3	72 hours
SMALL	1	36 hours
	2	48 hours
	3	7 days

*Major hub airports are listed in Engineering Handbook 11.

Special Rules for Alaska and Hawaii. For ASOS sites in Alaska and Hawaii to which air travel is the usual mode of transportation, outage time starts at departure on the first available flight after the notification of outage. If a delay occurs due to weather, flight schedules (commercial or chartered), or space availability and the delay could result in excessive ASOS outage time, notify the AOMC immediately. The maintenance report shall include the excess outage time and actions taken to lessen the delay.

3.2 Logistics Policies

3.2.1 Station Spares - A complement of on-site spares will be supplied to each ASOS area. Interim Contract Support (ICS) for ASOS will be provided until August 1993 by the contractor. When there is a failure at an ASOS site, the ET will identify the failed item and determine whether a spare is available in the maintenance support kit. When the spare is available, the ET will replace the failed item with a spare from the maintenance support kit and submit a routine requisition to NLSC per the instructions in Engineering Handbook (EHB) 1, Instrumental Equipment Catalog.

If no spare is available in CLS, the technician should call the Maintenance Assurance Section (W/OS0321), ASOS System Program Leader (SPL) during business hours. The SPL will coordinate with the ASOS maintenance engineer and program office to get the required spare part from the contractor for direct shipment to the site.

3.2.2 Warranty - NRC is responsible for FRU tracking and determining warranty repairs. ASOS technicians will return failed items to the NRC with failure documentation attached as prescribed by Engineering Handbook 4, Engineering Management Reporting System.

SECTION 4 **DOCUMENTATION**

4.1 Equipment Manuals - A set of maintenance manuals will be provided to each ASOS technician. The contractor will provide equipment manuals with site information tailored to each site.

4.2 Maintenance Schedule - Maintenance schedules for the LBC and HO83 are in EHB-8, Surface Equipment. The interim maintenance schedule for ASOS is contained in the ASOS Site Maintenance Manual, volumes I and II.

4.3 EMRS Reporting - The equipment reporting code for the ASOS will be "ASOS". Report the activation of ASOS in accordance with procedures detailed in EHB-4. The deactivation of any equipment that the ASOS replaces is to be reported in accordance with procedures in EHB-4.

4.4 Engineering Handbook 1 - Ordering information for all ASOS parts can be found in EHB-1, section S. Parts for ASOS are listed with an Agency Stock Number (ASN) prefix of S100.

SECTION 5 **TRAINING**

5.1 Formal Training - Maintenance training for ASOS is provided by the National Weather Service Training Center (NWSTC).

5.2 On-the-job Training - The installation and check-out procedure will provide initial maintenance experience for the ASOS technician. This experience, along with the site technical manual, will enable the ET to perform required maintenance and repair of ASOS.

SECTION 6 **ACCEPTANCE PROCEDURE**

6.1 Installation - The contractor will install all ASOS components at each ASOS site. Work on the glide slope tower will be done under the supervision of FAA technical personnel.

6.2 Acceptance - Following installation, the contractor will perform a complete calibration and checkout of the ASOS including communications and tower displays. Upon successful completion of these activities, the contractor will conduct a formal system acceptance test for the Government. These tests shall ensure the correct installation and functioning of hardware, software, and communications. See Attachment A.

SECTION 7

SYSTEM PERFORMANCE VERIFICATION

7.1 Maintenance Terminal Use - Maintenance operations are performed from the Operator Interface Device (OID) or the Remote Maintenance Monitor (RMM). From either of these terminals, users can access the diagnostic program displays. The terminal can be used to change output assignments for sensors, parameters, message formats, communications port characteristics,. and to enable and disable communications.

7.2 Performance Verification - The contractor will schedule and perform an operational demonstration for the Government. The contractor will notify the Government 14 days before the operational demonstration. Following acceptance of each ASOS by the Government, the system will undergo a Government commissioning process for approximately 30 days of continuous operation before commissioning.

7.3 Troubleshooting Techniques - The ASOS can perform two classes of tests. A continuous self test checks the ACU, DCP, sensors, buses, peripherals and communications, etc. There are off-line tests for faults that cannot be detected by the on-line tests. Refer to the Site Maintenance Manual for information on fault isolation.

The OID displays error messages that identify the specifics of a failure. A maintenance log provides information on maintenance status of restoration of malfunctions to an FRU. The maintenance log is a useful tool for fault isolation. A technician can review the maintenance log and determine failures or suspected failures based on data quality checks or other self tests - the suspect FRU or sub-FRU will be identified.

The ASOS Site Maintenance Manual provides troubleshooting and corrective maintenance procedures for aiding maintenance personnel to quickly remedy any problem and return the system to operational status.

SECTION 8

MAINTENANCE AIDS

8.1 Support and Test Equipment - The ASOS pressure sensors require a verification check every 6 months or when a sensor is replaced for corrective maintenance. The ASOS sensors will be checked against the Paroscientific pressure transfer standard model 760-16b. The procedure for the verification is described in detail in the ASOS site maintenance manual, volume II. Once a year, a replacement transfer standard will be issued from the national pressure calibration lab at NWS Headquarters. The out-of-date transfer standard will be returned to the NWS calibration lab.

8.2 Remote Maintenance Monitoring - There will be 12 complete Remote Maintenance Monitoring (RMM) systems delivered to the NWS. The RMM equipment is described below.

- Dell System 200 PC/AT
- 640 KB RAM
- 20 MB Hard Drive
- 1.44 MB Floppy Drive
- VGA Monitor
- DOS 3.3
- dBase IV 1.1
- Framework III
- Modem 2400 Baud

Lot 1 RMM equipment was sent to the Southern and Central Region Headquarters, NWSH, and NWSTC.

There is no national maintenance program for the RMM equipment. Each user of the equipment is responsible for maintenance and repair of the equipment. Funds are allocated to the regions for maintenance and repair of this equipment.

ACCEPTANCE PROCEDURES

1.0 Purpose - The inspection and acceptance plan provides mechanical and operational verification of the installed ASOS by using the system inspection procedures and the acceptance demonstration procedures. The ASOS inspection and acceptance demonstration summary documents are to be filled out by the NWS Technical Monitor as the various inspection and demonstration tasks are completed.

1.1 Duration of Inspection and Acceptance Procedures - Under normal conditions, the time required to perform these procedures should not exceed 4 hours for class I sites and 6 hours for class II sites.

1.2 Approach - The site inspection and acceptance procedures are initiated at the ACU and/or OID location. Acceptance of the system includes verification of system configuration, proper installation to include pressure sensors and venting, operation, stability, and accuracy of data. For inspection purposes, the NWS Technical Monitor will initiate the inspection at the indoor location (ACU/OID) and record the results on the inspection document as each specific area is inspected. The inspection procedures may be used in parallel with the demonstration procedures.

The NWS Technical Monitor will move to the outside location(s) to conduct a physical inspection and witness the conduct of acceptance procedures. The NWS Technical Monitor will witness the stimulation of the sensors and, on return to the ACU/OID, verify the data are received at the ACU and reflect the anticipated results.

1.3 System Inspection - The following procedure is provided to aid the NWS Technical Monitor in verifying acceptable system installation. A summary page, entitled "ASOS Inspection Summary Document," listing all sensors and peripherals, is attached and must be signed by the NWS Technical Monitor once the system has been inspected. The original and one copy will be given to the NWS Technical Monitor and the contractor will retain the other two copies. Four part carbonless forms are provided to the NWS Technical Monitor to record the results of the inspection and acceptance demonstration.

Similarly, the summary page, entitled "ASOS Demonstration Summary Document," lists the results of all equipment demonstrations and tests. The demonstration summary document must also be filled out by the NWS Technical Monitor and distributed as stated above. An example of the summary document is provided as well as a copy

of the actual inspection and demonstration summary documents. The NWS Technical Monitor conducting the inspection and witnessing the demonstration will recommend acceptance or rejection depending upon the results of the inspection and demonstration. The summary document will then be sent to the NWS Regional COTR for signature and forwarded to the ASOS Program Office. The inspection document and the demonstration document will be forwarded as a single package.

1.4 Required Documentation - The following documentation is required to complete the site inspection and demonstration.

- Current site survey
- GTA radio antenna site survey (if available)
- Site tables (Appendix D of contract)
- Baseline configuration listing
- Site specific data (i.e., special and local criteria for ceiling and visibility, AFOS phone data, and site opening and closing times)
- Installation, checkout, and calibration checklist
- Initialization checklist
- Stability test checklist

All documentation will be carried by the installation team and made available to the NWS Technical Monitor. When filling out the summary sheets, multiple sensors, DCPs, and peripherals may be noted by adding remarks similar to, "DCP #2 failed UPS test, CHI #1 has dented door, and/or VDU #3 failed to operate."

1.5 Required Tools and Test Equipment - The following tools and test equipment are required to conduct and complete the demonstration.

IBM compatible PC with modem, cables, and connectors	PROCOMM software
Pressure standard	Measuring tape
Common hand tools	Multimeter
Torpedo level	Lensatic compass
Safety equipment	Airband radio
Graduated cylinder	Mobile telephone
Calibration card STI 200	Water
Lens covers	Visibility cal kit
	Scatter plate

All required tools and test equipment are carried by the installation crew and are available for use in the demonstration.

SYSTEM INSPECTION PROCEDURES
INSPECTION ITEM

INDOOR LOCATION

1. Physically inspect the hardware, cables, and mechanical connections at the ACU. Verify serial numbers with list provided by the contractor.
 - a. Review site configuration data. Does listing reflect site tables?
 - b. Spot check for correct serial numbers. Are they correct?
 - c. Is there missing hardware i.e., nuts, bolts, fasteners?
 - d. Are cables neatly routed through raceways where applicable?
 - e. Are cables neatly routed and secured to walls where applicable?
 - f. Has the hardware been installed neatly within the area?
 - g. Are cables packaged neatly and secured with ties?
 - h. Check for physical damage.
2. Check all peripherals, excluding tower cab, for wiring routing, placement, and installation neatness.
 - a. Is power cord plugged into source?
 - b. Are peripherals placed at convenient locations?
Are cables routed correctly?
 - d. Are cable connectors tight?
 - e. Is the GTA radio properly located and secured?
 - f. Check for physical damage.
3. Has all residual material and trash been removed from area?

OUTDOOR LOCATION

4. Obtain access to ACU antenna location and inspect for proper installation.
 - a. Is antenna mounting bracket secure?
 - b. Is physical placement in accordance with survey data?
 - c. Is coaxial cable routed neatly?
 - d. Is weather head secure and sealed with silicon?
 - e. Is antenna vertical and in line of site with DCP Antenna?
 - f. Is input connector weather sealed with silicon?
 - g. Are ground connections tight?
 - h. Check for physical damage.
 - i. Check pressure sensor venting if so equipped.

SYSTEM INSPECTION PROCEDURES
INSPECTION ITEM

5. Obtain access to Ground-to-Air antenna.
 - a. Is antenna mounting bracket secure?
 - b. Is physical placement in accordance with contract requirements?
 - c. Is coaxial cable routed neatly?
 - d. Is weather head secure and sealed?
 - e. Is antenna vertical?
 - f. Is antenna properly grounded?
 - g. Check for apparent physical damage.
 - h. Is input connector weather sealed?
6. Data Collection Package
 - a. Verify serial numbers with list provided by the contractor.
 - b. Inspect for missing hardware, cable routing, and mechanical connections.
 - c. Are electrical power cables properly stripped and inserted into the AC terminal box?
 - d. Are fiber optic cables secure and tight?
 - e. Check that all wires are secure in the electrical box.
 - f. Check that antenna on DCP pole is secure and properly oriented.
 - g. Insure that conduit nuts at power distribution box and DCP are secure.
 - h. Check for physical damage.
 - i. Inspect all ground connection for tightness.
7. At the Precipitation Accumulation Sensor.
 - a. Inspect ground wire connection.
 - b. Verify mounting hardware is secure and complete.
 - c. Verify that the sensor orifice is level.
 - d. Check that all wires are secure in the electrical box.
 - e. Inspect power cables for proper mechanical connection.
 - f. Inspect fiber optic cable for tightness.
 - g. Verify that the bucket moves freely on its pivot by tipping the bucket two times. No binding should be noted.
 - h. Verify that the wind shield is secure and level.
 - i. Check for physical damage.
 - j. Check for correct height above ground.
 - k. Check wind shield height (1/2" to 1" above gauge orifice).

WHEN CHECKING SENSORS FOR CORRECT HEIGHT USE NWS LETTER W/OSD14:SSD:AC2061

SYSTEM INSPECTION PROCEDURES
INSPECTION ITEM

8. At the Temperature/Dew Point Sensor, open the door of the electronics box.
 - a. Verify correct labels for H083 (electronics box and sensor)
 - b. Inspect ground wire connections.
 - c. Verify mounting hardware is secure and complete.
 - d. Verify aspirator fan is running.
 - e. Check that all wires are secure in the electrical box.
 - f. Inspect power cabling for proper mechanical connection.
 - g. Inspect fiber optic cable for tightness.
 - h. Inspect for physical damage.
 - i. Check for correct height above ground and that sensor is over natural terrain - not the gravel path.
 - j. Verify that aspirator faces away from the DCP along the array centerline.
9. At the LEDWI (Present Weather Sensor), open the electronics enclosure and Faraday Box cover.
 - a. Inspect ground wire connections.
 - b. Verify mounting hardware is secure and complete and includes the hinge plate for tilt over capability.
 - c. Verify sensor receiver opening faces true north ($\pm 10^\circ$).
 - d. Inspect power cables for proper mechanical connection.
 - e. Inspect fiber optic cable for tightness.
 - f. Inspect for physical damage.
 - g. Check for correct height above ground.
10. At the Ceilometer
 - a. Inspect ground wire connections.
 - b. Verify mounting hardware is secure and complete.
 - c. Verify height above ground.
 - d. Verify proper orientation of sensor. Receiver should face true North $\pm 10^\circ$.
 - e. Inspect power cables for proper mechanical connection.
 - f. Inspect fiber optic cables for tightness.
 - g. Inspect for physical damage.
11. At the Freezing Rain Sensor

Procedures to be determined at award of contract.

SYSTEM INSPECTION PROCEDURES
INSPECTION ITEM

12. At the Visibility Sensor, open the electronics enclosure and the Faraday Box.
 - a. Inspect ground wire connections.
 - b. Verify mounting hardware is secure and complete and includes hinge plate for tilt over capability.
 - c. Verify that the sensor receiving head and day/night sensor head faces North ± 15 degrees.
 - d. Inspect power cables for proper mechanical connections.
 - e. Inspect fiber optic cables for tightness.
 - f. Inspect for physical damage.
 - g. Check for correct height above ground.
13. At the Wind Sensors
 - a. Inspect ground wire connections.
 - b. Verify mounting hardware is secure and complete to secure mast in the tilt position.
 - c. Inspect power cables for proper mechanical connections.
 - d. Inspect fiber optic cables for tightness.
 - e. Verify that both the speed cups and direction vane move freely.
 - f. Verify that the sensor and crossarm mounting hardware is secure and complete.
 - g. Check for physical damage.
 - h. Check lighting rod. Is it mounted securely?
 - i. Verify that the anemometer cups are mounted higher than the wind vane.
14. At conduit raceways
 - a. Inspect ground wire connections.
 - b. Verify mounting hardware is secure and complete.
 - c. Verify that flexible conduit is secure.
 - d. Verify that all exposed wire is neatly tied and secure.
 - e. Check for physical damage.
15. General area

Has all residual material and trash been removed from the sensor pad area?

ASOS INSPECTION DOCUMENT - SAMPLE

SID	AIRPORT NAME	STATE	DATE	START TIME	FINISH TIME
SNY	Sidney Municipal Airport	NE	8/24/91	0800	1300
ITEM NO.	INSPECTION ACTIVITY (See Procedures for Specific Items)	RESULTS			
		SAT	UNSAT*	N/A	OTHER
1.	ACU Installation to include pressure sensor venting	✓			
2.	ASOS Peripherals (Excluding Tower Cab) Installations	✓			
3.	General indoor site conditions	✓			
4.	ACU Antenna Installation		✓		
5.	Ground to Air Radio and Antenna Installation	✓			
6.	DCP Installation: DCP #1 <u>✓</u> DCP #2 <u> </u> DCP #3 <u> </u>		✓		
7.	Precipitation Accumulation Sensor Installation	✓			
8.	Temperature/Dewpoint Sensor Installation	✓			
9.	Present Weather Sensor Installation	✓			
10.	Ceilometer Installation: CEIL #1 <u>✓</u> CEIL #2 <u> </u>	✓			
11.	Freezing Rain Sensor Installation			✓	
12.	Visibility Sensor Installation: VIS #1 <u>✓</u> VIS #2 <u> </u>		✓		
13.	Wind Speed/Direction Sensor Installation	✓			
14.	Conduit Raceway Installation	✓			
15.	General Outdoor Site Conditions	✓			
<p>REMARKS: * Unsatisfactory results MUST be supported by narrative. Attach separate sheet(s) if necessary.</p> <p>4. (4d) No weatherhead installed.</p> <p>6. (6g) Large Dent in DCP #1 cover, paint flaking off, rust present.</p> <p>12. (12a) Improper ground connection, 3 of 5 wire strands broken.</p> <p>"All discrepancies were corrected on the spot and reflected satisfactory results."</p>					
<input checked="" type="checkbox"/> Recommend Acceptance <input type="checkbox"/> Recommend Rejection		Government Rep. Signature/Date			
<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED		Regional COTR Signature/Date			
ESI Rep. Signature/Date		ESI Remarks Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No			

ASOS INSPECTION DOCUMENT

SID	AIRPORT NAME	STATE	DATE	START TIME	FINISH TIME

ITEM NO.	INSPECTION ACTIVITY (See Procedures for Specific Items)	RESULTS			
		SAT	UNSAT*	N/A	OTHER
1.	ACU Installation, Pressure Sensors and venting				
2.	ASOS Peripherals (Excluding Tower Cab) Installations				
3.	General indoor site conditions				
4.	ACU Antenna Installation				
5.	Ground to Air Radio and Antenna Installation				
6.	DCP Installation: DCP #1 _____ DCP #2 _____ DCP #3 _____				
7.	Precipitation Accumulation Sensor Installation				
8.	Temperature/Dewpoint Sensor Installation				
9.	Present Weather Sensor Installation				
10.	Ceilometer Installation: CEIL #1 _____ CEIL #2 _____				
11.	Freezing Rain Sensor Installation				
12.	Visibility Sensor Installation: VIS #1 _____ VIS #2 _____				
13.	Wind Speed/Direction Sensor Installation				
14.	Conduit Raceway Installation				
15.	General Outdoor Site Conditions				

REMARKS: * Unsatisfactory results MUST be supported by narrative. Attach separate sheet(s) if necessary.

<input type="checkbox"/> Recommend Acceptance <input type="checkbox"/> Recommend Rejection	Government Rep. Signature/Date
<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	Regional COTR Signature/Date
ESI Rep. Signature/Date	ESI Remarks Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

INDOOR LOCATION

1. Review site specific documentation i.e., site surveys.
 - a. Have red-line changes been made?
 - b. Does the installed system reflect the red-line changes?
2. Review system configuration data.
 - a. Check initialization data i.e., station elevation, special and local criteria for ceiling and visibility data entered on site.
 - b. Is the data sampled in step a above correct? See site survey and/or site specific data for correct value(s).
 - c. Review one-minute screen. There should be no "M"s or "\$"s. If "\$"s, explain reason and correct problem before proceeding.
 - d. Review burn-in data briefly with ESI technician. There should be no "M"s or "\$"s. If any, determine whether all or part of the burn-in must be initiated before acceptance can continue.
3. Initiate system diagnostics.
 - a. Does it reflect that all elements are on line and operational?
 - b. Does the OID display "P" for pass at the completion of the test?
4. If the system is equipped with a UPS:
 - a. At the ACU, remove AC power by removing the AC plug from source.
 - b. Verify system is still operational at OID. Check input/output voltages
 - c. Allow at least 5 minutes and then replace AC plug back into AC source.
5. Pressure Sensor Check.
 - a. Set up the pressure standard at the same elevation as the pressure sensors and allow 10 minutes warm-up. If the ASOS pressure sensors are vented, temporarily remove the vent tube.
 - b. At the OID, record the pressure readings on the current data page for the appropriate ACU sensors in the table provided in the system acceptance demonstration document.

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

- c. Verify that the OID readings recorded above agree with the pressure standard to within 2.02 inches of mercury.

***** NOTE *****

AT VARIOUS LOCATIONS, STEP NUMBER 6
WILL REQUIRE ACCESS TO THE TOWER.

- 6. Check all peripherals for proper operation as described below. At class I locations, use ESI provided laptop and disregard references to audible alarm and OND.
 - a. At the OID, sign on as observer. Verify that the initials were printed. Edit the sky to El OVC, which will cause the system to generate a special observation (provided that the automated sky report is above 1,000 feet before editing). When the special is generated, verify that the audible alarm and observer notification device activate. When this check is complete, reset the sky report to automatic, which will most likely cause another special. Cancel the special and sign off.
 - b. For towered locations, in the tower, sign on as the air traffic controller. Use the COMMAND VOICE function to verify that the handset is functioning properly by recording a short message. Edit the present weather and add "T" (thunderstorm) to cause a special and enter "TEST" in remarks. Exit the EDIT function. Ensure that the alarm is activated. Once verified, remove "T" by resetting within EDIT and remove the remark "TEST". Sign off.
 - c. Check telephone lines to determine if voice communication is functioning. Verify voice output by dialing all lines at the ACU.
 - d. Connect monitor to Port 4B and verify airline terminal display (if so configured). See site survey.
 - e. On the CVD, verify that the wind updates every 5 seconds.
 - f. Verify AOMC receipt of an observation by calling the AOMC at 301-242-8194 or 301-242-8895. Also verify the correct time with the AOMC.
 - g. Verify port utilization by comparing the site table (available from the ESI technician) requirements with the following ACU definitions.
 - h. At the VDU, verify data is being displayed.

**SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM**

ACU JACK	FUNCTION	PORT	ACU JACK	FUNCTION	PORT
J1	FAA VOICE #1	5B	J19	AWIPS	10
J2	FAA VOICE #2	5B	J22	PRIMARY OID	3A
J3	FAA VOICE #3	5B	J23	AFOS HARDWIRE	2
J4	FAA VOICE #4	5B	J27	FAA TCCC	7
J5	FAA VOICE #5	5B	J28	LOCAL VDU	4A
J6	FAA VOICE #6	5B	J29	FAA ADAS	6
J7	FAA VOICE #7	5B	J30	AWIPS	
J8	FAA VOICE #8	5B	J31	FAA CVD	9
J9	FAA RADIO	5A	J38	AIRLINE DISP	4B
J10	FAA HAND SET	5C			
J11					
J12	AFOS PHONE	1			
J13	SECONDARY OID	3B			
J14	SECONDARY OID	3C			
J15	USER PORT #1	8 (REMOTE)			
J16	USER PORT #2	8 (REMOTE)			

***** NOTE *****

VERIFY THAT THE CHRONOMETER USED TO NOTE THE CURRENT TIME IN THE FOLLOWING TESTS IS SYNCHRONIZED WITH THE TIME DISPLAYED ON THE 1 MINUTE SCREEN PRIOR TO LEAVING THE ACU/OID LOCATION.

OUTDOOR LOCATION

7. At the DCP

- a. Open and verify that all lighted LED lamps are green.
- b. Verify that the auxiliary power outlet at the power panel measures 120 \pm 10 VAC by measuring the AC output using a multimeter.
- c. If equipped with UPS, remove power at the power distribution panel for 5 minutes and verify DCP operation.
- d. Verify red LED AC fail lamp illuminates and the audible alarm sounds.

8. At the Precipitation Accumulation Sensor

- a. Record the current date and time on the ASOS demonstration summary document.
- b. Slowly pour 185 ml of water into the orifice over a 3-minute period. (approximately ten tips of bucket)

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

Results will be verified on return to the ACU/OID location. OID shall display on 12 Hr. screen 0.10 ± 0.01 of precip. for the time in step 8a.

- 9A. At the Temperature/Dew Point Sensor (H083), open the electronics box door.
- a. Record the current date and time on summary document.
 - b. At the sensor transmitter logic board, set the TA/TD switch to the TA position.

***** NOTE *****

ALLOW AT LEAST 3 MINUTES AT EACH TEST POSITION IN STEPS C AND D TO INSURE AN ACCURATE READING AT THE ACU/OID LOCATION.

- c. Set the calibrate switch from OPERATE to 0 position and verify that the local display reads 32.0 ± 0.2 .
- d. Set the calibrate switch to the 50 position and verify that the local display reads 22.0 ± 0.2 .
- e. Return the calibrate switch to the OPERATE position and then place the TA/TD switch back to the TD position.
- f. Close and secure electronics box door.

RESULTS WILL BE VERIFIED ON RETURN TO THE ACU/OID LOCATION. THE OID WILL DISPLAY ON THE 12 HOUR SCREEN 32.0 ± 0.2 AND 122.0 ± 0.2 FOR THE RECORDED TIME PERIOD.

- 9B. At the Temp/Dew Point Sensor (1088), open the electronics box door.
- a. Record the current date and time on summary sheet.

***** NOTE *****

SEE NOTE PRIOR TO STEP 9A(c)

- b. At the sensor transmitter logic board, set the TA/TD switch to the TD position.
- c. Set the calibrate switch from OPERATE to TEST 0 position. Hold switch S2 to the right and verify that the local display 00.0 ± 0.2 . Release S2.

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

- d. Set the calibrate switch to TEST 50 position. Hold switch S2 to the right and verify that the display reads 50.0 ± 0.2 . Release S2.
- e. Return the calibrate switch to the OPERATE position and then place the TA/TD switch back to the TA position.
- f. Close and secure electronics box door.

RESULTS WILL BE VERIFIED ON RETURN TO THE ACU/OID LOCATION. OID SHALL DISPLAY ON THE 12 HR. SCREEN 32.0 ± 0.2 AND 122.0 ± 0.2 FOR THE RECORDED TIME PERIOD. DUE TO THE RAPID CHANGE IN TEMPERATURE, A DATA QUALITY ERROR MAY BE GENERATED.
--

***** WARNING *****

GAINING ACCESS TO THE ELECTRONICS WILL EXPOSE DEADLY VOLTAGES.
CARE MUST BE EXERCISED WHEN WORKING AROUND ENERGIZED EQUIPMENT.

***** CAUTION *****

IN ALL MAINTENANCE OPERATIONS, PREVENT DUST, PRECIPITATION, ETC.,
FROM COLLECTING ON THE LENSES AND ELECTRONICS! USE TEMPORARY
COVERS FOR THE LENSES IF NECESSARY. AVOID TOUCHING THE LENSES
WITH BARE HANDS.

- 10. At the LEDWI (Present Weather Sensor), open the electronics enclosure and Faraday Box cover.
 - a. Record the current date and time on summary sheet.
 - b. At the DCP, turn the LEDWI power circuit breaker to the OFF position.
 - c. At the LEDWI, remove the transmit logic card from the cage and install the LEDWI calibration card STI 200.
 - d. At the DCP, turn the LEDWI circuit breaker to the ON position.
 - e. After 8 minutes, turn the LEDWI circuit breaker to the OFF position.
 - f. Remove the STI 200 calibration card and install the transmit logic card.
 - g. At the DCP, return the LEDWI circuit breaker to the ON position.
 - h. At the LEDWI, close and secure the electronics enclosure door.

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

RESULTS WILL BE VERIFIED ON
RETURN TO THE ACU/OID LOCATION
THE OID SHALL DISPLAY ON 12 HR.
SCREEN "S+" DURING THE TESTING
PERIOD.

11. At the ceilometer, gain access to the internal electronic components.

***** NOTE *****

THE FOLLOWING PROCEDURE FORMAT DATA MAY BE VIEWED AT THE OID
USING DIRECT DIALOGUE CAPABILITY. IT CAN ALSO BE VIEWED AT THE
CEILOMETER USING THE LAPTOP COMPUTER. THE PROCEDURES ARE AS
FOLLOWS:

- a. Connect the PC laptop to the ceilometer modem port and open communication with ceilometer.
- b. Type "STA" at the ">" prompt and hit carriage return (CR).
- c. A message in the format given below should be displayed on the laptop screen.

```
CT12K STATUS
00 ///// ///// ///// ///// 0000000000
POWER STATUS
P10D 8.5 P20I 21.5 M20I -20.7 P25V 27.9
M20A -20.9 P20A 19.3 P12M 13.1 P10X 9.9
PXHV 140 P10R 10.2 MRHV -382
SIGNAL STATUS
LLAS 155 LSKY 1 GND 0
TEMPERATURE STATUS
TL 30 TE 20 TI 34 TB 22
HEATER OFF
BLOWER OFF
AUTOMATIC MODE
GAIN 2
LASER FREQUENCY 3
>(next input)
```

***** NOTE *****

ALARMS ARE REPORTED AS PLAIN LANGUAGE MESSAGES ADDED TO THE
STATUS REPORT OR, IN CASE OF NUMERICAL DATA, AN ASTERISK (*)
IMMEDIATELY AFTER THE NUMERICAL VALUE.

- d. Remove the laptop connections from the ceilometer modem port.

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

- e. Reconnect the ceilometer modem cable and secure the DCP doors.
12. Freezing Rain Sensor - To be provided later.
13. At the Visibility Sensor
- a. Visually verify transmitter head is flashing.
 - b. Record the current date and time on summary document.
 - c. Attach visibility scatter plate to the sensor pole.
 - d. Cover the Day/Night sensor lens.
 - e. At the DCP, cycle the Visibility circuit breaker off for 5 seconds, then on.
 - f. After 5 minutes, remove the Day/Night cover and visibility scatter plate.
 - g. At the DCP, cycle the Visibility circuit breaker off for 5 seconds, then on.

RESULTS WILL BE VERIFIED AT THE ACU/OID LOCATION. THE OID SHALL DISPLAY ON 12 HR. SCREEN "170"±15 AS THE VALUE OF EXTINCTION COEF- FICIENT AND "N" FOR NIGHT DURING THE TEST PERIOD.

14. At the Wind Sensor Mounting Pole Electronics Box.
- a. Check for correct height above ground. (See site table for other than standard height)
 - b. Tilt sensor pole over and support in horizontal position using ESI stand. Check that tower tilts properly and that mechanical parts operate smoothly; no binding.
 - c. Verify that both the speed cups and direction vane move freely. Using a lensatic compass, verify sensor orientation ($\pm 5^\circ$). (Alignment procedure may change in the near future)
 - d. Record the current date and time on summary sheet.
 - e. Align the direction vane to the North mark on the crossarm.
 - f. After 2 minutes, release the vane.
 - g. If the wind is causing the speed cups to revolve, then hold the cups stationary for 2 minutes. If there is no wind, moderately spin the cups while counting to 150. The value recorded in the 12 hour archive should be between 4 and 7 knots.

SYSTEM ACCEPTANCE DEMONSTRATION PROCEDURE
ACCEPTANCE DEMONSTRATION ITEM

- h. Cover the photo sensor and verify the operation of the warning lights.
- i. Return the sensor pole to the vertical position and secure properly.
- j. Close and secure the DCP Faraday Box and the DCP door.

RESULTS WILL BE VERIFIED ON RETURN
TO THE ACU/OID LOCATION. THE OID
SHALL DISPLAY ON THE 12 HR. SCREEN
5 SECONDS DATA 0 \pm 10 DEGREES
DURING THE STATIONARY TEST AND 4-7
KNOTS DURING THE ROTATING TEST.

ASOS DEMONSTRATION SUMMARY DOCUMENT - EXAMPLE

SID	NAME OF AIRPORT	STATE	DATE	TIME			
DEN	Denver International Airport	Co	10/24/91	0800	1400		
ITEM #/DESCRIPTION	RESULTS AND QUANTITIES DEMONSTRATED			SAT	UNSAT*	N/A	OTHER
1. DOCUMENTATION	Changes <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/>			
2. CONFIGURATION	IAW Site Tables <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Spot Checks <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			<input checked="" type="checkbox"/>			
3. DIAGNOSTICS	Operational <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No "P" for Pass <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			<input checked="" type="checkbox"/>			
4. UPS	ACU UPS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Test Passed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			<input checked="" type="checkbox"/>			
5. PRESSURE SENSOR	#1 <u>29.64</u> #2 <u>29.65</u> #3 <u>29.64</u> STD <u>29.64</u>			<input checked="" type="checkbox"/>			
6. PERIPHERALS	OID <u>2</u> Audible Alarm <u>2</u> OMD <u>1</u> PRT <u>1</u> VDU <u>4</u> CVD <u>6</u> ATC Hand-Set <u>1</u> Port Validation <u>1</u> <u>2</u> <u>3A</u> <u>3B</u> <u>3C</u> <u>4A</u> <u>4B</u> <u>5A</u> (circle port numbers being validated) <u>5B</u> <u>5C</u> <u>6</u> <u>7</u> <u>8</u> <u>9</u> <u>10</u> <u>11</u>			<input checked="" type="checkbox"/>			
7. DCP	#1 <input checked="" type="checkbox"/> UPS <input checked="" type="checkbox"/> #2 <input checked="" type="checkbox"/> UPS <input checked="" type="checkbox"/> #3 <input type="checkbox"/> UPS <input type="checkbox"/>				<input checked="" type="checkbox"/>		
8. PRECIP. ACCUM. SENSOR	Date <u>10/24</u> Time <u>1000</u> Expected <u>.10 ±.01</u> Actual <u>.10</u>			<input checked="" type="checkbox"/>			
9A. T/DP [H083]	Date <u> </u> Time <u> </u> Expected <u>32.0 ±0.2 & 122.0 ±0.2</u> Actual <u> </u>					<input checked="" type="checkbox"/>	
9B. T/DP [I088]	Date <u>10/24</u> Time <u>1045</u> Expected <u>32.0 ±0.2 & 122.0 ±0.2</u> Actual <u>32.0</u> <u>122.0</u>			<input checked="" type="checkbox"/>			
10. LEDWI	Date <u>10/24</u> Time <u>1100</u> Expected <u>"S+"</u> Actual <u>"S+"</u>			<input checked="" type="checkbox"/>			
11. CEILOMETER	Status Message = Demonstration Item 11(h) #1 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			<input checked="" type="checkbox"/>			
12. FREEZING RAIN SENSOR						<input checked="" type="checkbox"/>	
13. VISIBILITY SENSOR	Date <u>10/24</u> Time <u>1230</u> Expected <u>"170±15"</u> Actual <u>"176.41"</u> Date <u>10/24</u> Time <u>1300</u> Expected <u>"170±15"</u> Actual <u>"176.41"</u>			<input checked="" type="checkbox"/>			
14. WIND SENSOR	Date <u>10/24</u> Time <u>1400</u> Rotating <u>"4 - 7"</u> Actual <u>6</u> Date <u>10/24</u> Time <u>1400</u> Stationary <u>"0 ±10"</u> Actual <u>0°</u> Day/Night Sensor/Warning Lights <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail			<input checked="" type="checkbox"/>			
15. VERIFICATIONS: PHONE LINE (VOICE) <u> </u> AOMC RECEIPT OF OBS <u> </u> WINDS UPDATE EVERY <u> </u> PHONE LINE (USER) <u> </u> AFOS/ADAS COMMUNICATION <u> </u> 5 SECONDS ON CVD <u> </u>							
REMARKS: * Unsatisfactory results MUST be supported by narrative. Attach separate sheet(s) if necessary. 7. (7c) DCP #2 UPS FAILED TO OPERATE. CONTRACTOR REPLACED BATTERY CABLE AND 5 MINUTE TEST PASSED							
<input type="checkbox"/> Recommend Acceptance <input type="checkbox"/> Recommend Rejection			Government Rep. Signature/Date				
<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED			Regional COTR Signature/Date				
ESI Representative Signature/Date			ESI Remarks Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No				

ASOS DEMONSTRATION SUMMARY DOCUMENT

SID	NAME OF AIRPORT	STATE	DATE	TIME			
ITEM #/DESCRIPTION	RESULTS AND QUANTITIES DEMONSTRATED			SAT	UNSAT*	N/A	OTHER
1. DOCUMENTATION	Changes ___ Yes ___ No						
2. CONFIGURATION	IAW Site Tables ___ Yes ___ No Spot Checks ___ Yes ___ No						
3. DIAGNOSTICS	Operational ___ Yes ___ No "P" for Pass ___ Yes ___ No						
4. UPS	ACU UPS ___ Yes ___ No Test Passed ___ Yes ___ No						
5. PRESSURE SENSOR	#1 _____ #2 _____ #3 _____ STD _____						
6. PERIPHERALS	OID ___ Audible Alarm ___ OND ___ PRT ___ VDU ___ CVD ___ ATC Hand-Set ___ Port Validation 1 2 3A 3B 3C 4A 4B 5A (circle port numbers being validated) 5B 5C 6 7 8 9 10 11						
7. DCP	#1 _____ #2 _____ #3 _____ UPS _____ UPS _____ UPS _____						
8. PRECIP. ACCUM. SENSOR	Date _____ Time _____ Expected .01 ±.01 Actual _____						
9A. T/DP [H083]	Date _____ Time _____ Expected 32.0 ±0.2 & 122.0 ±0.2 Actual _____						
9B. T/DP [I088]	Date _____ Time _____ Expected 32.0 ±0.2 & 122.0 ±0.2 Actual _____						
10. LEDWI	Date _____ Time _____ Expected "S+" Actual _____						
11. CEILOMETER	Status Message = Demonstration Item 11(h) #1 ___ Yes ___ No #2 ___ Yes ___ No						
12. FREEZING RAIN SENSOR							
13. VISIBILITY SENSOR	Date _____ Time _____ Expected "170±15" Actual _____ Date _____ Time _____ Expected "170±15" Actual _____						
14. WIND SENSOR	Date _____ Time _____ Rotating "4-7" Actual _____ Date _____ Time _____ Stationary "0 ±10" Actual _____ Day/Night Sensor/Warning Lights ___ Pass ___ Fail						
15. VERIFICATIONS: PHONE LINE (VOICE) _____ AOMC RECEIPT OF OBS _____ WINDS UPDATE EVERY PHONE LINE (USER) _____ AFOS/ADAS COMMUNICATIONS _____ 5 SECONDS ON CVD _____							
REMARKS: * Unsatisfactory results MUST be supported by narrative. Attach separate sheet(s) if necessary.							
<input type="checkbox"/> Recommend Acceptance <input type="checkbox"/> Recommend Rejection			Government Rep. Signature/Date				
<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED			Regional COTR Signature/Date				
ESI Representative Signature/Date			ESI Remarks Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No				

ASOS OPERATIONS AND MONITORING CENTER

1. INTRODUCTION

The AOMC provides near real-time monitoring of the ASOS performance by identifying those ASOS sites unable to generate an observation during a standard window time, and those ASOS sites transmitting an observation with the maintenance status flag attached-- indicating possible sensor problems. The AOMC will also operate a trouble desk for tracking and documenting all reported and/or detected malfunctions involving ASOS sites. To assist those personnel reporting an ASOS site malfunction, toll-free telephone service will be provided.

The AOMC will initiate corrective maintenance action for all reported and/or detected ASOS malfunctions with the notification of the designated maintenance point-of-contact. The tracking of all maintenance actions will be automated to alert the AOMC operator when the projected restoration time for a specific maintenance action has been exceeded. The designated maintenance point-of-contact will then be notified to obtain a current update of the maintenance action.

Additionally, the AOMC maintains a data base of site specific parameters (ten data files) and provides access to that data base via a dial-up line. The AOMC also furnishes a master time source to all ASOS sites using the National Institute of Standards and Technology Automated Computer Time Service (NIST ACTS) to maintain accurate internal clocks and synchronization of the ASOS.

The AOMC was established as part of the Systems Monitoring and Coordination Center (SMCC) operating unit of the Systems Operations Center. The AOMC/SMCC controllers are tasked with operational duties and responsibilities in the day-to-day operation of the AOMC. A day-working analyst augments the current controller staff. The daily operation of the AOMC will result in a modest increase in workload for the AOMC/SMCC controllers.

2. FUNCTIONAL DESIGN

The AOMC will operate on an around-the-clock basis providing operational and maintenance support for the ASOS. The foreground portion of the AOMC computer system is that segment used to assist in the monitoring and maintenance notification process. The background system of the AOMC requires no intervention by the AOMC operator to provide support to ASOS. The AOMC operator is responsible for ensuring that both the foreground and background systems remain operational.

2.1 Foreground Functions (System monitoring and maintenance notification) - The foreground process encompasses the following areas:

- a. near real-time monitoring of ASOS performance:
- b. single point-of-contact for ASOS maintenance status:
- c. initiation of corrective maintenance action when ASOS observations are missing, the maintenance status flag is present within the observation, or when problems are reported via telephone:
- d. remote maintenance diagnostics capability; and
- e. maintenance of a trouble desk for tracking and documenting all reported and/or detected ASOS malfunctions.

The AOMC monitoring operation consists of identifying those ASOS sites whose observation was not received at the National Weather Service Telecommunications Gateway (NWSTG) by a given time (presently H+10 min) and any observation transmitted with the maintenance status flag attached. The processing of this data will be accomplished by the NWSTG computers. The Gateway will compile this data into two separate files: one with those Surface Aviation Observations (SAO) containing a maintenance status flag, the other containing those sites which failed to generate an SAO by the search time (e.g., H+10). The above files will be available to the AOMC in near real-time and immediately after the search time, respectively.

The maintenance status (fault) flag is automatically generated by an ASOS sites Acquisition Control Unit (ACU) when a fault or malfunction occurs. The maintenance status flag alerts the AOMC that maintenance support is required. The AOMC will initiate corrective maintenance action whenever;

- a. the NWSTG does not receive a high priority site's SAO prior to the search time or all a lower priority SAO is missed over two search times. (The number of consecutive missing observations is a user input parameter in the AOMC data base. This parameter will be adjusted in the future based on operational experience with ASOS field sites); or
- b. a site transmits its observation with a fault flag attached.

The AOMC's trouble desk will track and document all reported and/or detected ASOS malfunctions. When an ASOS site has a malfunction, the AOMC will call the designated maintenance

point-of-contact and provide notification of the malfunction. The AOMC will also provide a projected restoration time based on pre-established criteria (site class and type of failure). A follow-up call will be made if the restoration time is exceeded. When the malfunction has been repaired, the technician will notify the AOMC that the repair is completed and the trouble report will be closed.

When an ASOS malfunction is reported via the toll-free trouble reporting telephone numbers, a trouble report for the malfunction will be opened. The AOMC will determine whether and what type corrective action is needed. If requested, the AOMC will notify the individual reporting the problem when the repair is completed.

2.2 Background Functions (Site database and master time source)

- The AOMC provides additional support to ASOS sites through the management of their site-specific parameter files. The ASOS site-specific parameter files will consist of ten data files required by each ASOS site to remain operational. Additionally, the AOMC operates a software configuration management system capable of recreating a version of a site's master files upon request.

The uploading and downloading of an ASOS site's parameter files will be automated as much as possible. The software for an ASOS site is designed so that if any change(s) occurs to the ten data files, the ASOS will automatically dial the AOMC to upload the new configuration for storage in the AOMC's data base.

The ASOS time synchronization will be an automated process with an ASOS site dialing into the AOMC and retrieving a time update. The precision time source used by the AOMC will be the NIST ACTS.

An ASOS site's software will be configured to request a time update every 60 days or when a system reset/crash has occurred. When an ASOS site has been reset, the site will obtain three time updates: immediately after the system reset, 10 hours after the reset, and 7 days after the reset. After that, a time update will be required every 60 days.

Reporting Activation of the Automated Surface Observing System (ASOS)

General

This maintenance note provides information on activation of ASOS. The instructions provided in the Technical Information Package (TIP), Maintenance Note 1, Section 2.5, on EMRS reporting are incorrect. The ASOS Program Office will report the activation of ASOS to the appropriate authority.

Effect on Other Instructions

The second sentence in the TIP, Section 4, paragraph 4.3, is to be corrected. The deactivation procedure will still be followed and reported in accordance with instructions in EHB-4.

Procedure

The TIP, Section 4, paragraph 4.3, may be corrected by pen and ink. Correct the second sentence to read, "The activation of ASOS will be reported by the ASOS Program Office, not in accordance with procedures detailed in EHB-4."



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 3

Engineering Division

W/OS0321: BGM

Hygrothermometer Configurations

General :

This maintenance note describes the configurations of hygrothermometers now in use in standard surface instrumentation and the Automated Surface Observing System (ASOS) and their respective logistic support. Design changes and testing of the hygrothermometer continue. We expect the configurations to remain relatively stable, but further changes are possible. We will provide updates as required through maintenance and modification notes.

Hygrothermometer Configurations:

A summary of the five basic hygrothermometer configurations and their Field Replaceable Units (FRU) is provided below and in Figure 1.

H083	Standard NWS hygrothermometer
R83I	Interim refurbished H083
R83F	Final refurbished H083
1088I	Interim ASOS vendor-supplied hygrothermometer
1088F	Final version of 1088

The following sections describe the configuration and FRU requirements for each configuration.

H083 - The H083 is our standard hygrothermometer that was fielded in 1985. After implementation of ASOS, all but about 20 units will have been refurbished by the ASOS program and installed in ASOS systems. The requirements for the residual units will be reviewed, and units refurbished as appropriate.

The H083 can be supported over its expected life with the standard complement of FRUs. Three of these FRUs have variations that require discussion.

A. Dew Point Sensor. The H083 uses a P/N 1063-104 (ASN H083-1A1) dew point assembly as its standard sensor. The redesigned sensor, P/N 1063-104F, (ASN H083-1A1-1) is the preferred sensor and can be used with minor changes to the H083 calibration procedures. (See EHB-8, Section 2.4, Maintenance Note 10.) For ordering information see EHB-1, section H.

B. Transmit Logic Card. The H083 uses a P/N 1063-204 (ASN H083-2A1) transmit logic card. Some repaired 1063-204 cards and recently procured cards have higher quality amplifiers (OP14EZ or OP200AZ) installed. These cards are fully compliant and completely interchangeable.

C. Power Supplies. Both the H083 +5V power supply (P/N 1063-202, ASN H083-2A3) and the auxiliary power supply (P/N 1063-203, ASN H083-2A4) have redesigned versions (1063-202A and 1063-2031 respectively) that are fully compliant and completely interchangeable. The same power supplies support all versions of the hygrothermometer.

R83I - The interim refurbished H083 (R83I) is the unit initially supplied with ASOS. The R83I can be distinguished by its 1088-100 aspirator, which is a double hat, downward flow, small fan aspirator. Its production has been discontinued in lieu of the R83F. The R83I's currently installed in ASOS will be replaced with a R83F or a 1088F, both of which are described below. The replacement schedule is undetermined at this time. The R83I will be supported logistically as follows:

R83I FRUs -

A. Transmit Logic Card. The R83I uses the R1063-204 transmit logic card. The primary difference between the R1063-204 and the 1063-204 is the operating software. We will stock the R1063-204 under ASN S100-2MT4A2A1. For ordering information see EHB-1, section S.

B. Dew Point Sensor. The R83I uses a 1063-104F-1 dew point sensor for the first 17 ASOS commissioned units. For ordering information see EHB-1, section S. The 1063-104F-1 will be stocked under ASN S100-2MT4A1A1. All ASOS R83I sites that are not scheduled for commissioning use the 1063-104F.

C. Aspirator. The R83I uses the double hat 1088-100 aspirator. The fan is the only logistic support required. The R83I uses the standard H083 fan (1063-108).

D. Calibrator Assembly. The R83I uses the R1063-205 calibrator assembly. For H083's with serial numbers 1 through 22, change the calibration targets to 122.9 ± 0.2 (rather than 122.0 ± 0.2) for the $+50^{\circ}\text{C}$ calibrate for the Ta and Td channels and to 32.6 ± 0.2 (rather than 32.0 ± 0.2) for the 0°C calibrate position for both channels. For serial numbers 23 or greater follow normal procedures. This information was previously supplied through ASOS maintenance channels.

E. Power Supplies. Same for all hygrothermometers.

F. Autobalance Module. Same for all hygrothermometers.

R83F - The final version of the refurbished H083 differs from the R83I in the aspirator used and the configuration of the dew point sensor. The R83F can be distinguished by its 1088-400 aspirator, which is a single hat, upward flow, large fan aspirator. The R83F dew point sensor board and its cable are an integral unit. Elimination of the connector reduces the potential for corrosion under humid conditions. This is in some aspirators and sensors used on the final version of the 1088 (1088F). The schedule for replacement of installed R83I's with R83F's is undetermined.

R83F FRUs -

A. Aspirator/Fan. The R83F uses a reverse flow, large fan aspirator. The part number for the large fan is 1088-408. The part number for the shell is 1088-400.

B. Dew Point Sensor. The dew point sensor card for the R83F is the 1088-404, the integrated cable version. An ASN will be assigned later.

C. Transmit Logic Card. The R83F uses the R1063-204, the same as the R83I.

D. Calibrator Assembly. The R83F uses the R1063-205.

E. Power Supplies. Same for all hygrothermometers.

F. Autobalance Module. Same for all hygrothermometers.

1088 (General) - The 1088 is the contractor-furnished ASOS hygrothermometer. Since the subcontractor for the 1088 also designed and built the H083, the systems have common elements.

1088I - The 1088I is the current version of the 1088 that is being installed in ASOS. The 1088I can be distinguished by its 1088-100 aspirator, which is a double hat, downward flow, small fan aspirator. The 1088I uses the same aspirator as the R83I.

1088I FRUs -

A. Dew Point Sensor. 1063-104F.

B. Aspirator/Fan. 1088-100 (double hat) with the 1063-108 fan, the same as the R83I.

C. Transmit Logic Card. 1088-204C, ASN S100-31A2A1.

D. Calibrator Assembly. 1088-205A.

E. Power Supplies (+5V and Auxiliary). Same for all hygrothermometers.

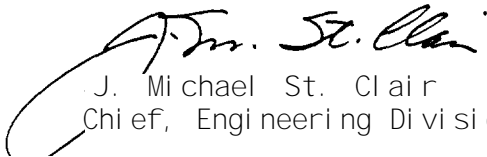
F. Autobalance. Same for all hygrothermometers.

1088F - The 1088F is the final version of the 1088 hygrothermometers. The 1088F can be distinguished by its 1088-400 aspirator, which is a single hat, upward flow, large fan aspirator. The 1088F uses the same aspirator as the R83F. However, deployment of the 1088F with that aspirator and sensor occurs much earlier than the R83F. The 1088F is being used in new ASOS installations.

1088F FRUs -

- A. Dew Point Sensor. 1088-404.
- B. Aspirator/Fan. Reverse flow aspirator (1088-400) with large fan (P/N 1088-408). Same comments on levels as R83F.
- C. Transmit Logic Card. 1088-204C.
- D. Calibrator Assembly. 1088-205A.
- E. Power Supplies. Same for all hygrothermometers.
- F. Autobalance. Same for all hygrothermometers.

Effect on Other Instructions: None.



J. Michael St. Clair
Chief, Engineering Division

Attachment

HYGROTHERMOMETER					
FRU	H083	R83I	R83F	1088I	1088F
Dew Point Sensor	1063-104 1063-104F (W/CAL MODS)	1063-104F noncommi ssi oned 1063-104F-1 commi ssi oned	1088-404	1063-104F	1088-404
Aspirator	1063-100	1088-100 NOT FRU	Reverse Flow Aspirator 1088-400 NOT FRU	1088-100 NOT FRU	Reverse Flow Aspirator 1088-400 NOT FRU
Aspirator Fan	1063-108	1063-108	Large Fan 1088-408	1063-108	Large Fan 1088-408
Transmi t Logic Card	1063-204	R1063-204	RI 063-204	1088-204C	1088-204D
Cal i brator Assembly	1063-205	R1063-205 NOT FRU	RI 063-205 NOT FRU	1088-205A NOT FRU	1088-205A NOT FRU
+5V Power Supply	1063-202 or 1063-202A	1063-202 or 1063-202A	1063-202 or 1063-202A	1063-202 or 1063-202A	1063-202 or 1063-202A
Aux i li ary Power Supply	1063-203 or 1063-2031	1063-203 or 1063-2031	1063-203 or 1063-2031	1063-203 or 1063-2031	1063-203 or 1063-2031
Auto Bal ance Modul e	1063-600	1063-600	1063-600	1063-600	1063-600

Figure 1

ASOS MAINTENANCE NOTE 4 (for Electronics Technicians)
Engineering Division
W/OS0321: BGM

Lightning Rod Safety Cover for the ASOS Wind Tower

General

This note provides information on constructing a cover for the sharp-pointed lightning rod mounted on the ASOS wind tower. The lightning rod cover is to prevent injury to anyone working around the wind tower.

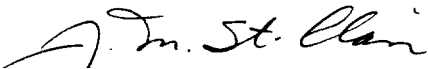
Procedure

Purchase locally a 3-foot piece of schedule #20 PVC pipe, 3/4-inch inside diameter, and end cap. Glue end cap onto the PVC pipe.

When the wind tower is in the horizontal position, cover the lightning rod with the PVC pipe to prevent an injury. Remove PVC pipe before returning the tower to the vertical position.

Effect on Other Instructions

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 5 (for Electronics Technicians)

Engineering Division

W/OSO321: BGM

Paroscientific Model 760-16B Portable Pressure Standard

General

This note provides users of the Paroscientific portable pressure standard Model 760-16B, P/N 1107-101, with information on the pressure meter readout and the battery circuit. Much of the information in this note is not in the Paroscientific instruction manual.

Procedure

The Paroscientific Model 760-16B portable pressure standard incorporates a 6-volt, 3-ampere-hour sealed lead acid battery for portable operation. Listed below are battery circuit characteristics.

1. A nominal charge for the battery is 6.3 to 6.7 volts.
2. The expected life of the battery is 100 hours between changes.
3. A low battery voltage (5.1 volts) is indicated by decimals being placed after each numeric digit being displayed.

Example of a good reading 14.4567 psi.

Example of low voltage display reading 1.4.4.5.6.7.

CAUTION

Do not use the portable pressure standard when the low battery indicator is on. You may continue to take readings if the portable pressure standard is plugged into an AC power outlet. The battery will charge at the same time.

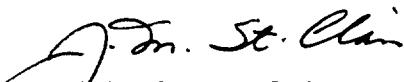
4. The Model 760-16B portable pressure standard charges at a controlled rate up to 180 Ma. A partially discharged battery (5.1 volt low battery) will take approximately 6 to 8 hours to reach full charge.
5. A fully discharged battery (0 to 3 volts) may not recover when charged. If the battery will not accept a charge, return the portable pressure standard to the pressure laboratory at:

National Weather Service
1325 East-West Highway
Silver Spring, MD 20910
Room 2378 Attn: Bernard Morningstar

6. The charging circuit is on when the portable pressure standard is plugged into an AC power outlet. The ON/OFF switch does not have to be on.
7. The LCD power on sequence with a fully charged battery will go through a stage where all LCD segments are ON (8.8:8.8:8.8), then OFF -----, then the pressure reading.
8. The front panel ZERO switch is actually a mathematical TARE switch. This means a software zero will be set for the portable pressure standard. When switched ON, it reads the pressure displayed and subtracts that amount from subsequent measurement. The display will then indicate the difference from the original value. When the ZERO switch is switched OFF this function is disabled.

Effect on Other Instructions

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 6 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Pressure Sensor Maintenance Check

GENERAL

The reporting of pressure data is critical to aircraft safety. This maintenance note addresses the remote possibility of erroneous pressure readings from system pressure sensors. When all system pressure sensors (two each for Class I and three each for Class II systems) report the same pressure value, the ASOS data quality algorithm cannot detect an error.

This note provides information and instructions for checking the ASOS pressure sensor plastic tubing after any maintenance action on or near the pressure sensor mounting shelf.

PROCEDURE

After any maintenance action in the area of the pressure sensors in the Acquisition Control Unit (ACU), check and verify that no sharp bends, cuts, kinks, pinches, or obstructions exist in the tubing. The vent located in the ACU on the I/O connector panel (1A9) must be checked for crimps, cuts, pinches, or obstructions.

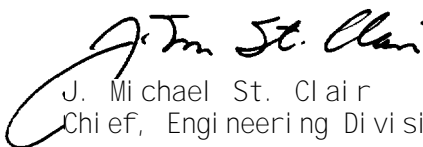
Verify the pressure sensor data by comparing sensor output data shown on the SENSOR status page at the Operator Interface Device (OID) against the portable pressure standard.

Verify the portable pressure standard monthly.

Adhere strictly to the ASOS Site Technical Manual S100, Chapter 8, Section V when performing any corrective or preventative maintenance. Reference ASOS Maintenance Note 5 for information about the Paroscientific Model 760-16B Portable Pressure Standard.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 7 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Setting up the Panasonic KX-P1180 and KX-P2180 Dot Matrix Printers

GENERAL

This maintenance note provides instructions to correct a garbling problem caused by incorrect settings on the Automated Surface Observing System (ASOS) dot matrix printers. The two models of dot matrix printers used with ASOS can be either a Panasonic model KX-P1180 or model KX-P2180. The KX-P2180 printer differs from the KX-P1180 in that it is set up by software keys instead of a DIP switch. The Operator Interface Device (OID) setup for both printers is the same.

KX-P2180 PROCEDURE

If the KX-P2180 is used, ensure that it is properly configured on the ACU serial communications page. Follow the steps below to configure the communications page.

1. LOGON to ASOS as a TEC or SYS on the OID.
2. Select REVUE, SITE, CONFIG, COMMS page.
3. Move the cursor to the printer port, press the CHANGE key, move cursor to HANDSHAKE, press the SEQN key until XON/XOFF protocol appears.
4. Press EXIT to return to the one-minute screen.

Printer parameters on this page should be set as follows:

BAUD RATE:	2400
PARITY SELECT:	NONE
BITS/CHAR:	8
STOP BITS:	
HANDSHAKE:	XON/XOFF

After specifying the ACU serial communications parameters, the printer must be manually set up using the front panel controls and indicators. Use the procedure below to set up the printer.

1. Turn printer POWER switch OFF.
2. While pressing and holding FUNCTION switch, turn POWER switch ON.
3. Press and release SUPER QUIET switch until ROW indicators are as follows:

FONT - OFF
PITCH - ON
FORM LENGTH - OFF
FONT - ON

4. Press TEAR OFF to toggle interface from parallel to serial. The indicator over the first column illuminates.
5. Press and release SUPER QUIET switch until ROW indicators are as follows:

FONT - OFF
PITCH - ON
FORM LENGTH - ON
FORM - ON
6. Press TEAR OFF key to toggle protocol from DTR to XON/XOFF. The indicator over the first column illuminates.
7. Press FUNCTION switch to exit initial setup mode. The ON LINE/FUNCTION indicator stops blinking.
8. Press SUPER QUIET switch to enter quiet mode.
9. Press FUNCTION switch to enter function mode. The ON LINE/FUNCTION indicator blinks.
10. Press and release TEAR OFF key until column indicator is blinking over MACRO.
11. Press LOAD PARK switch to save macro. A beep is heard and the column indicator stops blinking.
12. Press FUNCTION switch to exit function mode. The ON LINE/FUNCTION indicator stops blinking.

This completes the setup for the KX-P2180 printer.

KX-P1180 PROCEDURE

If the KX-P1180 is used, first manually set up the printer.

1. Turn printer power OFF. Remove cover per printer manual.
2. Locate DIP SW1-8 and set to the ON position. This selects the XON/XOFF protocol.
3. Reassemble, then turn printer power ON.
4. Follow the above procedure for the KX-P2180 (steps 1-4) to set up the communications page.

This completes the KX-P1180 setup.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 8 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Resetting ASOS Pressure Sensors

GENERAL

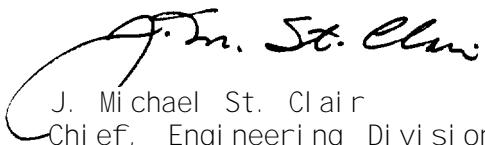
This maintenance note clarifies clearing of pressure sensor quality failures. There have been a few instances of technicians clearing pressure sensor data quality failures remotely. Because pressure sensors are critical to aircraft safety, it is imperative the technician go to the site and verify proper sensor operation.

PROCEDURE

Take positive action to ensure that pressure sensor data quality failures are cleared according to procedures in the ASOS Site Technical Manual paragraph 8.5.6.2.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair

Chief, Engineering Division

ASOS MAINTENANCE NOTE 10 (for Electronics Technicians)
Engineering Division
W/OS0321 :JLM

Calling the ASOS Operations and Monitoring Center (AOMC)

GENERAL

This note describes the procedure for notifying the AOMC of on-site maintenance actions on an ASOS. The AOMC monitors all ASOS failures. If an ASOS under maintenance reports an observation with missing parameters or a maintenance flag, the AOMC will call the ASOS point of contact for a maintenance action. Notifying the AOMC before starting on-site maintenance will eliminate extraneous phone calls. Calling the AOMC after maintenance is complete will allow the AOMC to close trouble tickets in a timely manner.

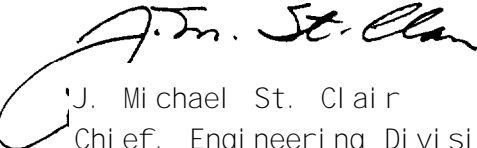
The AOMC also tracks installation of modifications. Calling the AOMC before installing any ASOS modifications will allow the AOMC to keep the ASOS configuration database up to date.

PROCEDURE

Each time a technician goes to an ASOS site for a maintenance action, he/she should call the AOMC at 1-800-434-1133 or 1-800-242-8194. Tell the AOMC person who answers that on-site maintenance is being performed. Also notify the AOMC when the maintenance action is complete.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 11 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM/MGC

Correction for the Laser Beam Ceilometer Calibration Procedure

GENERAL

This maintenance note corrects the Laser Beam Ceilometer (LBC) calibration procedure in the ASOS Site Technical Manual. Variation in the manufacturing processes of the CTX reflector hood results in improper operation with some LBCs. As a result, the calibration procedure must be modified. This calibration procedure change will work with all calibration kits and LBCs now in the field.

PROCEDURE

Make the following pen and ink changes to Table 9.5.3, CALIBRATION PROCEDURE, starting on page 9-84 of the ASOS Site Technical Manual:

1. Step 2. Delete Step 2.
2. Step 3. Replace Step 3 with the following:

Allow the ceilometer to be powered up for at least 10 minutes in the automatic mode with the CTX-16 reflector hood in place on the LBC so that the laser power can stabilize. Complete steps 3A through 3D in sequence and within 60 seconds to minimize laser power change during the test.

- 3A. Type **AUTO OFF <CR>**.
The LBC responds: MAINTENANCE MODE (after some possible intermediate statements).
 - 3B. Type **STA <CR>**.
LBC responds with status message.
Record values for LLAS and LASER FREQUENCY.
 - 3C. Type **GAIN 0**.
LBC responds: GAIN SELECT 0.
 - 3D. Type **MEAS 12**.
LBC responds: BACK SCATTERED POWER.
INPUT DATA AVE xx.xxxx
3. Step 4. Delete Step 4.
 4. Step 9. Delete Step 9.

5. Step 10. Change to read "MES <CR>" instead of "SEND 2".

6. Add Step 19: Type AUTO ON <CR>.

LBC responds: AUTOMATIC MODE.

Note: Failure to do this step will result in the LBC erroneously reporting the calibration values obtained above as cloud data. The ASOS will not detect this false condition.

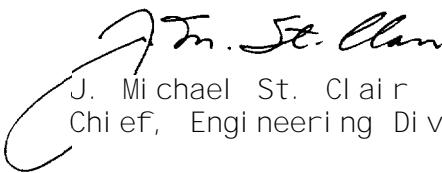
EFFECT ON OTHER INSTRUCTIONS

ASOS Site Technical Manual:

Page 9-85, Table 9.5.3

Page 9-86, Step 10

Page 9-87, Step 18



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 12 (for Electronics Technicians)

Engineering Division

W/OS0321: PT/BGM

Alternative Battery Check Procedure for the Liquid Precipitation Accumulation Sensor (LPAS)

GENERAL

Currently, the LPAS battery is checked by measuring the current through the Fiberoptic Transmitter (see the ASOS Site Technical Manual, Table 10.5.2, Step 3.) A measurement of less than 8 mA signifies a bad battery. However, some digital multimeters (DMM) have current measurement resolution of 10 mA only. Therefore, measurement of less than 8 mA is impossible. This note describes an alternative LPAS battery check procedure using voltage measurement.

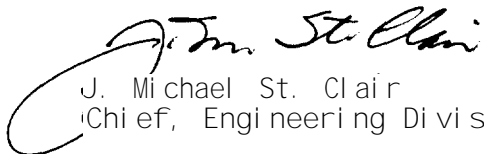
PROCEDURE

Make the following pen-and-ink change to the ASOS Site Technical Manual:

Add step: 3a. Alternatively, place the DMM leads (in voltage mode) across the 100 ohm resistor located beside the battery. Short the reed switch or mercury switch and read the voltage on the DMM. Replace the Fiberoptic Transmitter A2A2A1 if the voltage reading is below 800 mV.

EFFECT ON OTHER INSTRUCTIONS

ASOS Site Technical Manual, Page 10-20, Table 10.5.2.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 13 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Functional Designations for the Fiber Optic Modem S100-2A3A1-1.

GENERAL

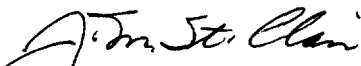
This maintenance note identifies the functional designations on the fiber optic modem board. The board is too small to properly incorporate the functional designations on the board during manufacture. Attached to this note is a layout of the fiber optic modem board identifying the functional designations that will aid in making the proper installation.

PROCEDURE

Refer to the attached diagram for functional designations in making the proper installation.

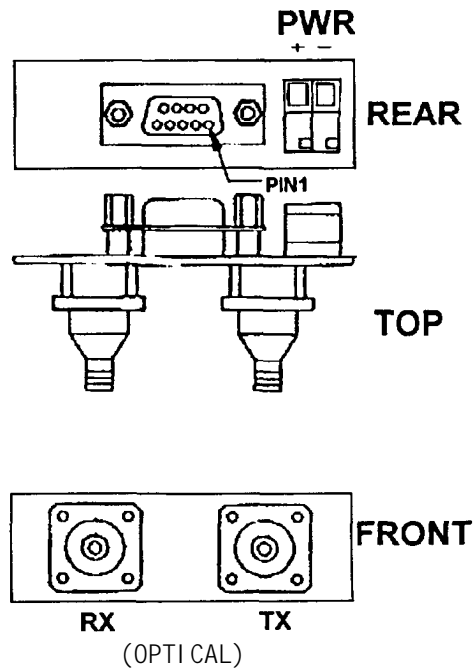
EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

Attachment



Fiber Optic Modem S100-2A3AL1-1

ASOS MAINTENANCE NOTE 14 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

Time Set For ASOS Every 90 Days

GENERAL

If the ASOS system time is off by more than 15 seconds the TIME function allows the user to correct the system clock. This function is available only to users signed on at the technician or system manager level. This note provides instructions for the technician to do a time set every 90 days.

PROCEDURE

The procedure for executing the CMD function is:

1. Log on as TECH.
2. Key the CMD function.
3. Key the TIME function.
4. Key EXIT.
5. Log off.

This completes the procedure.

EFFECT ON OTHER INSTRUCTIONS

None.



J. Michael St. Clair
Chief, Engineering Division

ASOS MAINTENANCE NOTE 15 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Reduction of ASOS Hygrothermometer Mirror Cleaning Period

GENERAL

Modification Note 16 provides a temporary deactivation of the autobalance module on all ASOS hygrothermometers. Experience from some of the sites that have performed Modification Note 16 indicates that the lack of autobalance compensation for mirror dirt has caused dew point errors. The symptoms of this error are dew points that gradually rise above the true dew point over time and that exceed the ambient temperature under higher humidity conditions. The hygrothermometer returns to correct operation immediately after cleaning the mirror.

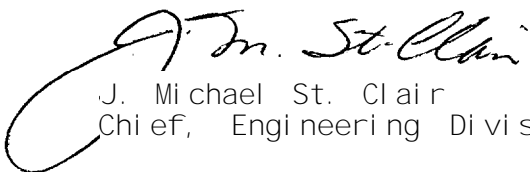
This Maintenance Note provides for reducing the mirror cleaning period from quarterly to a maximum of 45 days for commissioned sites. This procedure is temporary and will be in effect until the firmware which corrects the autobalance problems is fielded.

PROCEDURE

1. For ASOS hygrothermometers at commissioned sites, the mirrors are to be cleaned at intervals not to exceed 45 days.
2. The optical loop adjustment interval remains as specified in the site technical manual, that is, every 90 days as part of the preventative maintenance cycle.

This completes the procedure.

Effects on Other Instructions: None



J. Michael St. Clair
Chief, Engineering Division

PRELIMINARY

ASOS MAINTENANCE NOTE 16 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM/JM

Wind Direction Vane and Wind Speed Cup Assembly Skirt Clearance

GENERAL

This note provides directions for use of a test fixture to verify the concentricity of the skirt on ASOS Wind Direction Vane and Wind Speed Cup assemblies. This test fixture will identify early production vane and cup assemblies which suffer from skirts which are not concentric with the neck of the bottle. It has been determined that these early production units may not provide sufficient clearance to be used on the MOD 2 bottle. All sites should have the Wind Direction Vane and Wind Speed Cup assemblies checked for concentricity and clearance prior to installation of MOD 2 bottles.

If a Wind Vane and/or Wind Speed Cup Assembly fail this test, they must not be used on MOD 2 bottles. The Electronics Technician should identify the units as having failed the concentricity test and return the units to NRC. Additionally, all Wind Vane and Wind Speed Cup assemblies which are part of the spares kits should be tested.

This test fixture, S100-TE329, can be ordered through NLSC and consists of two hardware components; a 0.374 inch dowel and a sliding clearance gauge. The dowel is secured to the hub of the vane or cup assembly using the set screw which normally holds the assembly to the bottle shaft. The sliding clearance gauge is then allowed to "slide" down the dowel until it contacts the inside top surface of the skirt. If the gauge contacts the sides of the skirt before seating on the hub surface, the assembly does not pass the test and must be returned to NRC. If the assembly passes the sliding gauge test, then it is fitted to a MOD 2 bottle and spun by hand while verifying visually that there is no contact between the MOD 2 bottle neck and the inside of the skirt.

PROCEDURE

Before performing this maintenance test, follow all procedures normally performed before beginning a maintenance action.

The following instructions use the fixture to test the skirt eccentricity. Read all instructions before using the fixture.

1. Lower tower per ASOS Site Technical Manual S-100 (page 4-44, Table 4.5.10).
2. After the wind tower is secured, remove the wind vane.

3. Attach the 0.374 inch (9.5 mm) drill blank (dowel) to the wind vane hub by sliding the dowel into the hole in the center of the hub and tightening the set screw. Note that the set screw should not be over-tightened. It is sufficient to "snug" the set screw until it holds the dowel without allowing the dowel to move in the hole.
4. Slide the clearance gauge onto the dowel.
5. With the wind vane inverted so that gravity causes the clearance gauge to fall into the skirt, observe that the clearance gauge freely falls to the bottom of the skirt and is fully seated on the hub. Repeat the test several times and if the clearance gauge contacts the side walls of the skirt and does not contact the hub, the wind vane assembly should be rejected and cannot be used on the MOD 2 wind bottle.
6. Remove the fixture from the wind vane. If the wind vane passed, attach the wind direction vane to the Mod 2 bottle and spin the vane assembly by hand. Look up under the skirt while the assembly is spinning and verify that no contact between the skirt and bottle neck is evident.
7. Remove the wind speed cup assembly.
8. Attach the 0.374 inch (9.5 mm) drill blank (dowel) to the wind speed cup hub by sliding the dowel into the hole in the center of the hub and tightening the set screw. Note that the set screw should not be over-tightened. It is sufficient to "snug" the set screw until it holds the dowel without allowing the dowel to move in the hole.
9. Slide the clearance gauge onto the dowel.
10. With the wind speed cup assembly inverted so that gravity causes the clearance gauge to fall into the skirt, observe that the clearance gauge freely falls to the bottom of the skirt and is fully seated on the hub. Repeat the test several times and if the clearance gauge contacts the side walls of the skirt and does not contact the hub, the wind speed cup assembly can not be used on the MOD 2 wind bottle.
11. Remove the fixture from the wind speed cup assembly. If the wind speed cup passed, attach the wind speed cup to the Mod 2 bottle and spin the cup assembly by hand. Look up under the skirt while the assembly is spinning and verify that no contact between the skirt and bottle neck is evident.
12. Raise the tower per ASOS Site Technical Manual.
13. Return the ASOS to its normal operating condition.
14. If either the wind vane assembly or the wind speed cup assembly fails this test, it cannot be used on the MOD 2 bottle. The failed assembly should be identified as having failed the concentricity test and

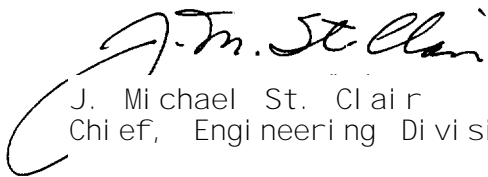
and returned to the NRC. Please contact John Monte with comment or questions about this procedure.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



J. Michael St. Clair
Chief, Engineering Division

ERRATA SHEET NO 1 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Pen-and-ink the number 16 to Maintenance Note titled "Wind Direction Vane and Wind Speed Cup Assembly Skirt Clearance" issuance date of March 31, 1995.

General

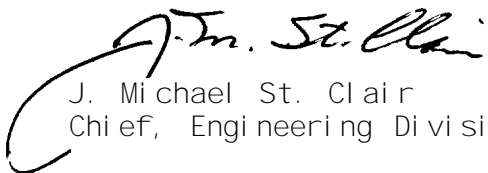
A pen-and-ink change is to be made to the first page of the maintenance note with the title "Wind Direction Vane and Wind Speed Cup Assembly Skirt Clearance" issuance date of March 31, 1995. The number was omitted during printing.

Effects on Other Instructions

None

Procedure:

Pen and ink the number 16 after the words ASOS MAINTENANCE NOTE located on the second line of page one. File the note in Engineering Handbook Volume 2, Section 2.6.



J. Michael St. Clair
Chief, Engineering Division

Ordering ASOS Site Technical Manual and Changes From NLSC

GENERAL

This note provides information on how and where to obtain publications for the ASOS program site technical manual, binders and changes. Other required forms and publications for the ASOS program can be obtained from the logistic supply system.

Personnel requiring items from the National Logistics Supply Center (NLSC) will either initiate an order using the Consolidated Logistics System or contact their designated regional focal point. Some forms and publications may require national headquarters approval.

PROCEDURE

The address for the NLSC is listed below.

National Logistics Supply Center
1510 E. Bannister Road, Bldg 1
Kansas City, MO 64131

All publications and forms for the ASOS are listed in EHB-1 catalog, section X.

Below is a list with the description and Agency Stock Number (ASN) to use when ordering the following items. These items are essential to the ASOS field technician.

DESCRIPTION

1. ASOS Site Technical Manual *Rev A*
2. ~~ASOS Site Technical Manual Changes,~~
3. Binder for Site Technical Manual

ASN

XASOS ~~Tech Manual~~
XASOS-Chg-2
XASOS-TM-Binder

EFFECT ON OTHER INSTRUCTIONS

None.

Rev A is obsolete

NSN 7010-10-100-0-21

REPORT MAINTENANCE ACTION

None.

J. Michael St. Clair

J. Michael St. Clair
Chief, Engineering Division

ENGINEERING HANDBOOK 11 VOLUME 2
ERRATA SHEET 1 (for Electronics Technicians)
Engineering Division
W/OSO321:AJW

SECTION 2.6

Errata to Ordering ASOS Site Technical Manual and Changes from NLSC Maintenance Note 17.

General

A pen-and-ink change is to be made to the first page of Maintenance Note 17, with the title "Ordering ASOS Site Technical Manual and Changes From NLSC," and the issuance date of April 27, 1995.

Procedure:

Make the following pen-and-ink changes to Maintenance Note 17:

1. In Description add:

4. ASOS Site Technical Manual Changes
(NSN: NWS9-62-620-0006)

XASOS-Chg-3

Effects on Other Instructions

Updates to Maintenance Note 17.

port Maintenance Action

None.



John McNulty
Chief, Engineering Division

ASOS ERRATA SHEET 2

(for Electronics Technicians)

Engineering Division

W/OSO321: BGM/AJW

Errata to Maintenance Note 17, "Ordering ASOS Site Technical Manual and Changes from the National Logistics Support Center (NLSC)."

General

A pen-and-ink change is to be made to the first page of Maintenance Note 17, with the title "Ordering ASOS Site Technical Manual and Changes From NLSC," and the issuance date of April 27, 1995. Revision A (REV. A) is a new complete ASOS Site Technical Manual, and is to completely replace the existing ASOS Site Technical Manual.

Procedure

1. Order an ASOS Site Technical Manual REV. A from NLSC to replace the old manual.

Make the following pen-and-ink changes to Maintenance Note 17:

2. Line number (1), under the heading "DESCRIPTION," add the word "REV. A" to the end of the ASOS Site Technical Manual.
3. Line number (2), delete "ASOS Site Technical Manual Changes," under the "DESCRIPTION" heading, and delete "XASOS-CHG-2," under the Agency Stock Number (ASN) heading.

Effect on Other Instructions

Errata Sheet 1 for Maintenance Note 17 is obsolete, and is to be removed from EHB-11.

Report Maintenance Action

None.



John McNulty

Chief, Engineering Division

W/OSO321 :AJWissman:713-1834x165

K:\OSO32\OSO321:errata17.h11

spellchecked:6/5/97:src

EHB-11

Issuance 97- 08
6/30/97

ASOS MAINTENANCE NOTE 18 (for Electronics Technicians)

Engineering Division

W/OS0321: BGM

Automated Surface Operating System (ASOS) Spares Kit.

GENERAL

The purpose of this maintenance note is to circulate the official ASOS technician spares kit list (attached). Any changes to this list will be issued as a maintenance note. Technicians requiring items for initial issue must notify Bobby McCormick or Al Wissman at 301) 713-1835 or by cc: Mail.

PROCEDURE

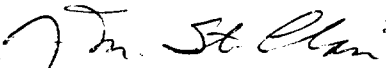
Contact Bobby McCormick or Al Wissman.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



J. Michael St. Clair

Chief, Engineering Division

SPARES KIT FOR ASOS TECHNICAL

	NSN	PRIMARY - ASN SECONDARY - ASN	DESCRIPTION	QTY
1	5999-01-248-3598	K220-1A5(S100-2MT1A5)	LIGHT MONITOR	1
2	5999-01-248-3593	K220-1A6(S100-2MT1A6)	RECEIVER	1
3	5999-01-248-3594	K220-1A7(S100-2MT1A7)	TRANSMITTER	1
4	6660-01-249-1431	K220-1B1(S100-2MT1B1)	WINDOW CONDITIONER	1
5	6660-01-331-4152	K220-1TE2(S100-TE1TE2)	CTX-16 OPTICAL COUP/FIX	1
6	5895-01-368-4614	S100-10-2	MODEM,V.3225 STAND ALONE	1
7	7025-01-368-4593	S100-11	DEVICE, OPER INTERFACE	1
8	5998-01-368-8655	S100-1A2A1	BOARD, CPU FIRM 1.8	1
9	5998-AS-000-0009-X	S100-1A2A13-1	BOARD, A/D	1
10	5905-AS-000-0119-X	S100-1A2A14	BOARD, VME RESISTOR	1
11	5998-AS-000-0008-X	S100-1A2A15-1	BOARD, DIGITAL I/O	1
12	5998-01-368-8654	S100-1A2A16	VIDEO CONT BD.	1
13	5965-AS-000-0011-X	S100-1A2A20	PROCESSOR, VOICE VDS	1
14	5998-01-368-8651	S100-1A2A3	BOARD, ACU MEM XVE-1	1
15	5998-AS-000-0007-X	S100-1A2A5	BOARD, SERIAL I/O RS422	1
16	5998-01-368-8652	S100-1A2A6-1	BOARD,SERIAL I/O, RS232	1
17	5895-01-368-8662	S100-1A3A1	MODEM MODEL 2440 RACK	1
18	5895-AS-000-0114-X	S100-1A3A1-2	MODEM.V.3225 RACK	1
19	6130-01-299-2561	S100-1A3PS1	POWER SUPPLY ACU RACK	1
20	5935-AS-000-0116-X	S100-1A3XA1	ADAPTER, MODEM	1
21	5998-AS-000-0015-X	S100-1A4A1	PANEL, PCB STATUS	1
22	5998-01-369-4730	S100-1A4A2-1	RS232 INTFC BOARD	1
23	6625-AS-000-0018-X	S100-1A4A3	INV 1.5KVA PCB FILTER	1
24	5998-01-368-4595	S100-1A4A4	PCB-INV 1.5KVA BOARD	1
25	5920-00-998-2231	S100-1A4F1	FUSE, UPS	1
26	6130-01-368-8643	S100-1A5PS1	POWER SUPPLY	1
27	6685-01-368-4611	S100-1A6A1	SENSOR, SETRA	1
28	5895-01-381-0769	S100-1A6A4-3	MODEM 410.075 MOTOROLA	2
29	5930-01-411-5106	S100-1A6S1	RF SWITCH	1
30	5920-AS-000-0084-X	S100-1A7A12-1	TERMINAL BLOCK	1
31	5920-AS-000-0085-X	S100-1A7A12-20	GROUND TERMINAL BLOCK	1
32	5935-AS-000-0104-X	S100-1A9A1-1	ADAPTER, RJ-11/RS232	1
33	6110-AS-000-0020-X	S100-1A9A5	SURGE PROTECTOR, VIDEO	1
34	5935-AS-000-0112-X	S100-1A9J1	CONNECTOR, EMI SURGE	1
35	5935-AS-000-0111-X	S100-1A9J22	ADAPTER, EMI SURGE	1

36	6110-AS-000-0021-X	S100-1A9J39	SURGE DETECTOR, RF	1
37	5915-AS-000-0103-X	S100-1A9J40	FILTER, UPS OUTPUT	1
38	5915-AS-000-0107-X	S100-1A9J41	FILTER, AC LINE	1
39	4130-01-370-1991	S100-1FL1	FILTER AIR, ACU	1
40	6145-AS-000-0069-X	S100-1W72	CABLE, TELCO	1
41	5998-01-368-8658	S100-2A1A2A1	CPU BOARD, DCP	1
42	5905-AS-00-0120-X	S100-2A1A2A10	BOARD, VME RESISTOR	1
43	5998-01-368-4601	S100-2A1A2A3	BOARD, MEMORY XVME-1	1
44	5998-01-368-8647	S100-2A1A3A2	CIRCUIT BREAKER MDL	1
45	5998-01-369-4727	S100-2A1A3A5	CIRCUIT BREAKER MDL	1
46	5998-01-368-4594	S100-2A1A3A6	CIRCUIT BREAKER MDL	1
47	5998-AS-100-0041-X	S100-2A1A3A7	CIRCUIT BREAKER MDL	1
48	5998-01-368-8648	S100-2A1A3A8	CIRCUIT BREAKER MDL	1
49	4140-AS-000-0086-X	S100-2A1B1	FAN	1
50	4540-01-245-4803	S100-2A1HR1	HEATER ELEMENT	1
51	5945-01-028-2033	S100-2A1K1	RELAY, SOLID STATE	1
52	5930-AS-000-0108-X	S100-2A1S1	THERMOSTAT 60/40	1
53	5930-AS-000-0109-X	S100-2A1S2	THERMOSTAT 70/50	1
54	5930-AS-000-0110-X	S100-2A1S3	THERMOSTAT 80/60	1
55	6030-01-411-8853	S100-2A3A1-1	MODEM, FIBER OPTIC	1
56	6130-AS-000-0061-X	S100-2A3A17-10	BLOCK, POWER DISTR.	1
57	5920-AS-000-0082-X	S100-2A4A1-1	TERMINAL BLOCK FUSE	1
58	5920-AS-000-0083-X	S100-2A4A1MP3	FUSE PLUG	1
59	5961-AS-000-0063-X	S100-2A4CR1	DIODE	1
60	5961-01-016-8485	S100-2A4CR3	SEMICONDUCTOR	1
61	6130-01-186-4853	S100-2A4PS1	POWER SUPPLY +5 V	1
62	6130-AS-000-0062-X	S100-2A4PS3	POWER SUPPLY +12V	1
63	6033-AS-000-0118-X	S100-2A6S1	PHOTO CONTROL	1
64	5998-01-368-4600	S100-2A8MT1A1A2	CARD, PROC CONT 3.0	1
65	6660-AS-000-0052-X 6685-AS-200-0133-X	S100-2A8MT1A2A2 S100-2A8MT1A2A2-1	CUP, ASSEMBLY SMALL SKIRT LARGE SKIRT	1
66	6660-AS-000-0053-X 6660-AS-200-0142-X	S100-2A8MT1A3A2 S100-2A8MT1A3A2-1	VANE, ASSEMBLY SMALL SKIRT LARGE SKIRT	1
67	5999-92-000-0108-X	S100-2MT1A1	DATA PROC. FIRMWARE 2.46	1
68	6130-01-372-9200	S100-2MT1PS1	POWER SUPPLY, ASOS LBC	1
69	7010-AS-000-0032-X	S100-2MT2A1A1A1	CARD, TRANSMITTER	1
70	5998-01-368-4596	S100-2MT2A1A1A3	CARD, MICRO FIRM 3.49	1
71	5998-01-368-4598	S100-2MT2A1A1A6	SIG. PROCESS CARD 11	1
72	5998-01-368-4597	S100-2MT2A1A1A7	SIG. PROCESS CARD 1	1

73	7010-AS-000-0033-X	S100-2MT2A1A1A8	CARD, RECEIVER AGC	1
74	6685-01-368-4825	S100-2MT2A2	SENSOR HEAD LEDWI	1
75	6130-01-208-5925	H083-2A3(S100-2MT2A3)	POWER SUPPLY 1063-202A	1
76	6130-01-205-6975	H083-2A4(S100-2MT2A4)	POWER SUPPLY 1063-2031	1
77	8010-AS-200-0048-X	S100-2MT2MS1	INSECTA PAINT	1
78	6660-AS-200-0065-X	S100-2MT41A1-1	DEWPOINT SENSOR	1
79	5805-AS-000-0044-X	S100-2MT4A2A1-1	TRANSMIT LOGIC AAI 1088	1
80	5998-01-369-4728	S100-2MT4A2A1-2	TRANSMIT LOG.R1063-204	1
81	5998-01-368-4599	S100-2MT5A1A1	CONTROLLER FIRM	1
82	6660-01-369-5858	S100-2MT5A2A3	OPTICAL TRANSMITTER	1
83	6660-01-369-5857	S100-2MT5A2A4	OPTICAL DETECTOR	1
84	6660-01-368-4826	S100-2MT5A5	SENSOR DAY/NIGHT	1
85	6025-01-369-7460	S100-2MT6A2A2A1	F/O TRANSMITTER	2
86	5995-AS-000-0080-X	S100-2A5S1W13	CABLE, DCP RF SW OUT	1
87	5995-AS-000-0077-X	S100-2A5A1W3	CABLE, DCP RF SW MODEM1	1
88	5995-AS-000-0078-X	S100-2A5A2W4	CABLE, DCP RF SW MODEM2	1
89	5995-AS-000-0074-X	S100-2A3W42	CABLE, DCP RF SW ANT	1
90	7025-01-368-8646	S100-41	VIDEO DISPLAY UNIT	1
91	5965-AS-000-0030-X	S100-5	HANDSET, FAA	1
92	6625-01-354-3026	S100-TE300	RS232-TEST BOX	1
93	6625-01-354-3025	S100-TE301	GAUGE, TORQUE	1
94	5895-94-000-0072-X	S100-TE323 OR TE302	LAPTOP COMPUTER	1
95	6660-01-196-6971	S100-TE303	COMPASS, MAGNETIC	1
96	6640-01-383-1098 6640-00-264-8323	S100-TE304	BEAKER CAP 800ML	1
97	6625-01-354-3015	S100-TE305	VISIBILITY CAL KIT	1
99	5995-01-366-6300	S100-TE307	CABLE, NULLING	1
100	6625-01-354-3017	S100-TE308	FIELD TESTER PRE/WEA	1
101	5995-01-366-6278	S100-TE309	CABLE, INTERFACE	1
102	6685-00-840-6317	S100-TE315	PSYCHROMETER, ASPIRATED	1
103	4920-92-000-0110-X	S100-TE316	SOLAR NOON ALIGN KIT	1
104	6625-00-978-6012	S100-TE320	WATTMETER, RF	1
105	5995-AS-200-0046-X	S100-TE321	WIND SP TEST CABLE	1
106	6020-AS-000-0067-X	S100-2MT6W23	CABLE ASSY, FIB OPT 50FT	1
107	6625-00-497-2912	T520-17 (S100-TE320-3)	5 WATT, ELEMENT	1
108	5820-01-369-1352	S100-1A10	TRANSMITTER, GTA RADIO	1
109	6660-AS-200-0092-X	S100-2A8MT1A2A1-1	WIND SPEED XMTR (MOD2)	1
110	6660-AS-200-0093-X	S100-2A8MT1A3A1-1	WIND DIRECTION XMTR (MOD2)	1

Errata to Automated Surface Operating System (ASOS) Spares Kit
Maintenance Note 18.

GENERAL

This errata sheet provides page replacements and a page addition for Maintenance Note 18. Permanent National Stock Numbers (NSN) were assigned to some of the items since Maintenance Note 18 was published. These NSN changes are now incorporated into Errata Sheet 1, ASOS spares list. The support equipment ASNs and NSNs and description for Ground to Air Radio (GTA) equipment were added to the Errata Sheet 1, ASOS spares list.

All of the "-Xs" are removed from temporary NSNs. This is consistent with the way the temporary NSNs will be in the catalog (EHB-1).

PROCEDURE

Remove and replace pages 2,3 and 4 with the updated ASOS spares kit list information. Add page 5 to the existing ASOS spares kit list.

EFFECT ON OTHER INSTRUCTIONS

Updates Maintenance Note 18.

REPORT MAINTENANCE ACTION

None.



Acting Chief, Engineering Division

SPARES KIT FOR ASOS TECHNICIANS

	NSN	PRIMARY - ASN SECONDARY - ASN	DESCRIPTION	QTY
1	5999-01-248-3598	K220-1A5(S100-2MT1A5)	LIGHT MONITOR	1
2	5999-01-248-3593	K220-1A6(S100-2MT1A6)	RECEIVER	1
3	5999-01-248-3594	K220-1A7(S100-2MT1A7)	TRANSMITTER	1
4	6660-01-249-1431	K220-1B1(S100-2MT1B1)	WINDOW CONDITIONER	1
5	6660-01-331-4152	K220-1TE2(S100-TE1TE2)	CTX-16 OPTICAL COUP/FIX	1
6	5895-01-368-4614	S100-10-2	MODEM,V.3225 STANDALONE	1
7	7025-01-368-4593	S100-11	DEVICE, OPER INTERFACE	1
8	5998-01-368-8655	S100-1A2A1	BOARD, CPU FIRM 1.8	1
9	5998-01-390-2153	S100-1A2A13-1	BOARD, A/D	1
10	5905-AS-000-0119	S100-1A2A14	BOARD, VME RESISTOR	1
11	5998-01-390-2151	S100-1A2A15-1	BOARD, DIGITAL I/O	1
12	5998-01-368-8654	S100-1A2A16	VIDEO CONT BD.	1
13	5998-01-390-2148	S100-1A2A20	PROCESSOR, VOICE VDS	1
14	5998-01-368-8651	S100-1A2A3	BOARD, ACU MEM XVE-1	1
15	5998-01-368-8653	S100-1A2A5	BOARD, SERIAL I/O RS422	1
16	5998-01-368-8652	S100-1A2A6-1	BOARD,SERIAL I/O, RS232	1
17	5895-01-368-8662	S100-1A3A1	MODEM MODEL 2440 RACK	1
18	5895-01-308-2794	S100-1A3A1-2	MODEM.V.3225 RACK	1
19	6130-01-299-2561	S100-1A3PS1	POWER SUPPLY ACU RACK	1
20	5935-01-389-8232	S100-1A3XA1	ADAPTER, MODEM	1
21	5998-AS-000-0015	S100-1A4A1	PANEL, PCB STATUS	1
22	5998-01-369-4730	S100-1A4A2-1	RS232 INTFC BOARD	1
23	5915-01-389-3012	S100-1A4A3	INV 1.5KVA PCB FILTER	1
24	5998-01-368-4595	S100-1A4A4	PCB-INV 1.5KVA BOARD	1
25	5920-00-998-2231	S100-1A4F1	FUSE, UPS	1
26	6130-01-368-8643	S100-1A5PS1	POWER SUPPLY	1
27	6685-01-368-4611	S100-1A6A1	SENSOR, SETRA	1
28	5895-01-381-0769	S100-1A6A4-3	MODEM 410.075 MOTOROLA	2
29	5930-01-411-5106	S100-1A6S1	RF SWITCH	1
30	5920-AS-000-0084	S100-1A7A12-1	TERMINAL BLOCK	1
31	5920-AS-000-0085	S100-1A7A12-20	GROUND TERMINAL BLOCK	1
32	5935-AS-000-0104	S100-1A9A1-1	ADAPTER, RJ-11/RS232	1
33	6110-AS-000-0020	S100-1A9A5	SURGE PROTECTOR, VIDEO	1

EHB-11
 Issuance 95-17
 12/4/95

34	5935-01-399-2558	S100-1A9J1	CONNECTOR, EMI SURGE	1
35	5935-01-399-2554	S100-1A9J22	ADAPTER, EMI SURGE	1
36	5920-01-337-1181	S100-1A9J39	SURGE DETECTOR, RF	1
37	5915-01-389-3113	S100-1A9J40	FILTER, UPS OUTPUT	1
38	5915-01-389-3004	S100-1A9J41	FILTER, AC LINE	1
39	4130-01-370-1991	S100-1FL1	FILTER AIR, ACU	1
40	5995-01-389-2014	S100-1W72	CABLE, TELCO	1
41	5998-01-368-8658	S100-2A1A2A1	CPU BOARD, DCP	1
42	5905-AS-00-0120	S100-2A1A2A10	BOARD, VME RESISTOR	1
43	5998-01-368-4601	S100-2A1A2A3	BOARD, MEMORY XVME-1	1
44	5998-01-368-8647	S100-2A1A3A2	CIRCUIT BREAKER MDL	1
45	5998-01-369-4727	S100-2A1A3A5	CIRCUIT BREAKER MDL	1
46	5998-01-368-4594	S100-2A1A3A6	CIRCUIT BREAKER MDL	1
47	5925-01-390-2150	S100-2A1A3A7	CIRCUIT BREAKER MDL	1
48	5998-01-368-8648	S100-2A1A3A8	CIRCUIT BREAKER MDL	1
49	4140-AS-000-0086	S100-2A1B1	FAN	1
50	4540-01-245-4803	S100-2A1HR1	HEATER ELEMENT	1
51	5945-01-028-2033	S100-2A1K1	RELAY, SOLID STATE	1
52	5930-01-332-1095	S100-2A1S1	THERMOSTAT 60/40	1
53	5930-01-391-2510	S100-2A1S2	THERMOSTAT 70/50	1
54	5930-01-391-2511	S100-2A1S3	THERMOSTAT 80/60	1
55	6030-01-411-8853	S100-2A3A1-1	MODEM, FIBER OPTIC	1
56	5940-01-390-2559	S100-2A3A17-10	BLOCK, POWER DISTR.	1
57	5920-AS-000-0082	S100-2A4A1-1	TERMINAL BLOCK FUSE	1
58	5920-01-389-4077	S100-2A4A1MP3	FUSE PLUG	1
59	5961-AS-000-0063	S100-2A4CR1	DIODE	1
60	5961-01-016-8485	S100-2A4CR3	SEMICONDUCTOR	1
61	6130-01-186-4853	S100-2A4PS1	POWER SUPPLY +5 V	1
62	6130-01-390-2201	S100-2A4PS3	POWER SUPPLY +12V	1
63	6033-AS-000-0118	S100-2A6S1	PHOTO CONTROL	1
64	5998-01-368-4600	S100-2A8MT1A1A2	CARD, PROC CONT 3.0	1
65	6660-AS-000-0052 6685-AS-200-0133	S100-2A8MT1A2A2 S100-2A8MT1A2A2-1	CUP, ASSEMBLY SMALL SKIRT LARGE SKIRT	1
66	6660-01-390-7357 6660-AS-200-0142	S100-2A8MT1A3A2 S100-2A8MT1A3A2-1	VANE, ASSEMBLY SMALL SKIRT LARGE SKIRT	1
67	5998-01-420-6855	S100-2MT1A1	DATA PROC. FIRMWARE 2.46	1
68	6130-01-372-9200	S100-2MT1PS1	POWER SUPPLY ASOS LBC	1

69	5998-01-375-4810	S100-2MT2A1A1A1	CARD, TRANSMITTER	1
70	5998-01-368-4596	S100-2MT2A1A1A3	CARD, MICRO FIRM 3.49	1
71	5998-01-368-4598	S100-2MT2A1A1A6	SIG. PROCESS CARD 11	1
72	5998-01-368-4597	S100-2MT2A1A1A7	SIG. PROCESS CARD 1	1
73	5998-01-375-4811	S100-2MT2A1A1A8	CARD, RECEIVER AGC	1
74	6685-01-368-4825	S100-2MT2A2	SENSOR HEAD LEDWI	1
75	6130-01-208-5925	H083-2A3(S100-2MT2A3)	POWER SUPPLY 1063-202A	1
76	6130-01-205-6975	H083-2A4(S100-2MT2A4)	POWER SUPPLY 1063-2031	1
77	8010-AS-200-0048	S100-2MT2MS1	INSECTA PAINT	1
78	6660-01-412-2335	S100-2MT41A1-1	DEWPOINT SENSOR	1
79	5998-01-375-4812	S100-2MT4A2A1-1	TRANSMIT LOGIC AAI 1088	1
80	5998-01-369-4728	S100-2MT4A2A1-2	TRANSMIT LOG.R1063-204	1
81	5998-01-368-4599	S100-2MT5A1A1	CONTROLLER FIRM	1
82	6660-01-369-5858	S100-2MT5A2A3	OPTICAL TRANSMITTER	1
83	6660-01-369-5857	S100-2MT5A2A4	OPTICAL DETECTOR	1
84	6660-01-368-4826	S100-2MT5A5	SENSOR DAY/NIGHT	1
85	6025-01-369-7460	S100-2MT6A2A2A1	F/O TRANSMITTER	2
86	5995-01-407-8412	S100-2A5S1W13	CABLE, DCP RF SW OUT	1
87	5995-01-407-8411	S100-2A5A1W3	CABLE, DCP RF SW MODEM1	1
88	5995-01-397-6345	S100-2A5A2W4	CABLE, DCP RF SW MODEM2	1
89	5995-01-389-2473	S100-2A3W42	CABLE, DCP RF SW ANT	1
90	7025-01-368-8646	S100-41	VIDEO DISPLAY UNIT	1
91	5805-01-389-9541	S100-5	HANDSET, FAA	1
92	6625-01-354-3026	S100-TE300	RS232-TEST BOX	1
93	6625-01-354-3025	S100-TE301	GAUGE, TORQUE	1
94	7021-01-411-9999 7010-01-289-2959	S100-TE323 OR TE302	LAPTOP COMPUTER	1
95	6660-01-196-6971	S100-TE303	COMPASS, MAGNETIC	1
96	6640-01-383-1098 6640-00-264-8323	S100-TE304	BEAKER CAP 800ML	1
97	6625-01-354-3015	S100-TE305	VISIBILITY CAL KIT	1
99	5995-01-366-6300	S100-TE307	CABLE, NULLING	1
100	6625-01-354-3017	S100-TE308	FIELD TESTER PRE/WEA	1
101	5995-01-366-6278	S100-TE309	CABLE, INTERFACE	1
102	6685-00-840-6317	S100-TE315	PSYCHROMETER, ASPIRATED	1
103	5180-01-412-0008	S100-TE316	SOLAR NOON ALIGN KIT	1
104	6625-00-978-6012	S100-TE320	WATTMETER, RF	1

EHB-11

Issuance 95- 17

12/4/95

105	5995-AS-200-0046	S100-TE321	WIND SP TEST CABLE	1
106	6020-01-390-3484	S100-2MT6W23	CABLE ASSY, FIB OPT 28.5 FT	1
107	6625-00-497-2912	T520-17 (S100-TE320-3)	5 WATT, ELEMENT	1
108	5820-01-369-1352	S100-1A10	TRANSMITTER, GTA RADIO	1
109	6660-AS-200-0092	S100-2A8MT1A2A1-1	WIND SPEED XMTR (MOD2)	1
110	6660-AS-200-0093	S100-2A8MT1A3A1-1	WIND DIRECTION XMTR (MOD2)	1
111	6625-01-080-5452	S100-TE320-4	DETECTING ELEM.	1
112	7035-01-412-0002	S100-TE401	SCOPE CARRING CASE	1
113	5340-01-411-9980	S100-TE402	SCOPE FRONT COVER	1
114	5935-01-412-0009	S100-TE351	RJ11 TO TDA 310-4C	1
115	5935-01-411-5249	S100-TE352	BNC TO N ADAPTER	1
116	5935-01-411-5250	S100-TE353	BNC TO BINDING POSTS	1
117	6625-01-411-9530	S100-TE356	MEGGER	1
118	6625-01-411-5232	S100-TE357	AUDIO GENERATOR	1
119	6625-01-411-9532	S100-TE403	SCOPES	1
120	6625-01-360-3380	T160	COUNTER	1
121	6625-00-949-5382	T520-4	ELEMENT 100-250MHZ 10 WATT	1
122	6625-00-980-8255	T520-5	ELEMENT 100-250MHZ 25 WATT	1
123	6130-01-411-5252	S100-1A4A1-2	DELTEC POWER SUPPLY	1
124	5895-01-364-6861	S100-1A1-1	STANDARD CODES MODEM	1
125	5895-01-364-6864	S100-1A1-2	PREMIUM CODES MODEM	1
126	5895-01-411-9983	S100-1A1A1-1	CARTRIDGE FLEX, STANDARD	1
127	5895-AS-200-0067	S100-1A1A1-2	CARTRIDGE FLEX, PREMIUM	1
128	7030-AS-200-0116	S100-TE318	SOFTWARE, BERT	1
129	5999-AS-200-0103	S100-TE335 (T520-18)	1 WATT ELEMENT 110-160 MHZ	1
130	7025-AS-200-0102	S100-TE320-1 (T522-1)	TERMINATOR RF 25 WATT 50 OHM	1
131	5995-01-183-4467	T331-13	BNC TO BNC	1

ASOS ERRATA SHEET 2 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

Errata Sheet 2 to Automated Surface Observing System (ASOS) Spares Kit Maintenance Note 18.

General:

Errata Sheet 2 provides an additional two pages of 51 spare parts for the new mini ASOS spares kit. The kit can only be obtained with the permission of National Weather Service regional headquarters.

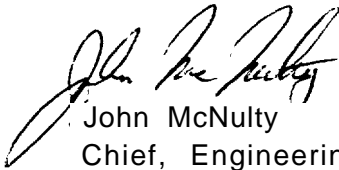
Procedure:

Attach this errata Sheet 2 to ASOS Maintenance Note 18.

Effect on Other Instructions:

Do not remove Errata Sheet 1 parts list; it is still in effect.

Errata Sheet 2 updates Maintenance Note 18 to include this mini spares kit.



John McNulty

Chief, Engineering Division

MINI-SPARES KIT				
	NSN	PRIMARY - ASN SECONDARY - ASN	DESCRIPTION	QTY
1	6660-01-249-1431	K220-1B1(S100-2MT1B1)	WINDOW CONDITIONER	1
2	6660-01-331-4152	K220-1TE2(S100-TE1TE2)	OPTICAL COUPLING FIXTURE	1
3	5998-01-390-2146	S100-1A2A1-1	BOARD, CPU	1
4	5998-01-368-8651	S100-1A2A3	BOARD, MEM, ACU	1
5	5998-01-368-8652	S100-1A2A6-1	BOARD,SERIAL I/O, RS232	1
6	5895-01-368-8662	S100-1A3A1	MODEM, MODEL 2440 RACK MOUNT,	1
7	5895-01-308-2794	S100-1A3A1-2	MODEM, V.3225 RACK MOUNT	1
8	5895-01-381-0769	S100-1A6A4-3	MODEM, RADIO 410.075 MHZ	2
9	6110-01-389-2467	S100-1A9A5	SURGE PROTECTOR, VIDEO	1
10	5935-01-399-2558	S100-1A9J1	CONNECTOR, EMI SURGE	1
11	5935-01-399-2554	S100-1A9J22	ADAPTER, EMI SURGE	1
12	5920-01-337-1181	S100-1A9J39	DETECTOR, RF SURGE	1
13	5915-01-389-3113	S100-1A9J40	FILTER, UPS OUTPUT	1
14	5915-01-389-3004	S100-1A9J41	FILTER, AC LINE	1
15	5998-01-368-8658	S100-2A1A2A1	CPU BOARD, DCP	1
16	5998-01-368-4601	S100-2A1A2A3	BOARD, MEMORY XVME-100/02	1
17	6030-01-411-8853	S100-2A3A1-1	MODEM, FIBER OPTIC	1
18	5920-AS-000-0082	S100-2A4A1-1	TERMINAL BLOCK FUSE	1
19	5920-01-389-4077	S100-2A4A1MP3	FUSE, PLUG	1
20	5998-01-432-3079	S100-2A8MT1A1A2-1	CARD, PROC. CONT. FIRMWARE 3.0	1
21	5998-01-420-6855	S100-2MT1A1	DATA PROCESSOR BOARD	1
22	6660-01-412-2335	S100-2MT41A1-1	SENSOR, DEWPOINT 1088	1
23	5998-01-375-4812	S100-2MT4A2A1-1	TRANSMIT LOGIC P/N 1088-204D-201	1
24	5998-01-369-4728	S100-2MT4A2A1-2	PC CARD,TRANSMIT LOGIC	1
25	6025-01-369-7460	S100-2MT6A2A2A1	TRANSMITTER, FIBER OPTIC	1
26	6625-01-354-3026	S100-TE300	TEST BOX, RS232	1

MINI-SPARES KIT				
	NSN	PRIMARY - ASN SECONDARY - ASN	DESCRIPTION	QTY
27	6625-01-354-3025	S100-TE301	GAUGE, TORQUE WATCH	1
28	7010-01-289-2959	S100-TE302	COMPUTER, LAPTOP	1
29	6640-01-383-1098	S100-TE304	CYLINDER, NONWETTING	1
30	6625-01-354-3015	S100-TE305	CALIBRATION, KIT, WIND, VISIBILITY	1
31	6110-AS-200-0079	S100-TE305-1	JUMPER, MOLEX CONNECTOR	1
32	5995-01-366-6300	S100-TE307	CABLE, "Y" INTERFACE, LAPTOP	1
33	6625-01-354-3017	S100-TE308	FIELD TESTER, PRESENT WEATHER	1
34	5995-01-366-6278	S100-TE309	CABLE, INTERFACE, NULLING	1
35	6685-00-840-6317	S100-TE315	PSYCHROMETER, ASPIRATED	1
36	5180-01-412-0008	S100-TE316	ALIGNMENT KIT, SOLAR NOON	1
37	7030-AS-200-0116	S100-TE318	SOFTWARE, SERIALBERT	1
38	7030-AS-200-0158	S100-TE318-1	SOFTWARE, ASOS CALIBRATION	1
39	6625-01-080-5452	S100-TE320-4	DETECTING ELEMENT, P/N 4274-025	1
40	5995-AS-200-0046	S100-TE321	CABLE, WIND SEED TEST	1
41	7035-01-412-0004	S100-TE323-1	CARRYING CASE	1
42	3010-00-857-2090	S100-TE327	COUPLING, SHAFT, FLEXIBLE, L050	1
43	5935-01-411-5249	S100-TE352	ADAPTER, N-PLUG TO BNC	1
44	5935-01-411-5250	S100-TE353	PLUG, BCN TO BINDING POSTS,	1
45	6625-01-411-9530	S100-TE356	MEGGER, BIDDLE, P/N 210801-3CL	1
46	6625-01-411-5232	S100-TE357	GENERATOR, AUDIO, 20HZ-150HZ	1
47	6625-00-978-6012	T520	WATTMETER, BIRD, P/N 1000H	1
48	6625-00-497-2912	T520-17 (S100-TE320-3)	ELEMENT, 5 WATT	1
49	6625-00-949-5382	T520-4	ELEMENT, 10 WATT, 100-250MHZ	1
50	5985-01-432-2240	T522-1 (S100-TE320-1)	TERMINATOR, RF, 50 OHM, 25 WATT	1
51	6660-01-431-4380	S100-TE400-1	PRESSURE STANDARD, TRAVEL	1

Setting up the Panasonic KX-P3123 Impact Dot Matrix Printers

GENERAL

This maintenance note provides instructions to correctly install a new dot matrix printer to prevent a garbling problem caused by incorrect settings on the Automated Surface Observing System (ASOS) dot matrix printers. The new model of dot matrix printer used with ASOS can be a Panasonic model KX-P3123 (existing models of Panasonic model KS-P1180 or model KX-P2180 are still in use).

KX-P3123 PROCEDURE

When the KX-P3123 is used, ensure that it is properly configured on the ACU serial communications page (There should be no changes required). Follow the steps below to configure the communications page.

1. LOGON to ASOS as a TEC or SYS on the OID.
2. Select REVUE, SITE, CONFIG, COMMS page.
3. Move the cursor to the printer port, press the CHANGE key, move cursor to HANDSHAKE, press the SEQN key until XON/XOFF protocol appears.
4. Press EXIT to return to the one-minute screen.

Printer parameters on this page should be set as follows:

BAUD RATE:	2400
PARITY SELECT:	NONE
BITS/CHAR:	8
STOP BITS:	1
HANDSHAKE:	XON/XOFF

After specifying the ACU serial communications parameters, the printer must be manually set up using the front panel controls and indicators. Use the procedure below to set up the printer.

1. Print out current printer settings by following page 58 of Operating Instructions included with printer.

2. Verify the following.
 - a. Interface set to serial Interface.
 - b. What Baud rate is set.
 - c. What character length is set.
3. If interface is set to parallel, change to serial interface by following steps on pages 56 to 60 of Operating Instructions.
4. If a 2400 Baud rate is not set, change to 2400 Baud rate by following steps on pages 56 to 60 of Operating Instructions.
5. If 8 bit character data length is not set, change to 8 bit data length by following steps on pages 56 to 60 of Operating Instructions.

This completes the setup for the KX-P3123 printer.

EFFECT ON OTHER INSTRUCTIONS

None.

Acting Chief, Engineering Division

Freezing Rain Sensor Field Calibration

GENERAL

This note provides that with the new Freezing Rain Sensors being issued, there will be no field calibration done by the technician. The new Freezing Rain Sensor Frequency will be factory calibrated at 40,000 Hz. Frequency verification will check that frequency is 40,000 Hz \pm 15 Hz, under specific environmental conditions (Section 11.5.3.3). The Freezing Rain Sensor will now be the Field Replaceable Unit (FRU). The ASOS Program Office will be monitoring the Freezing Rain Sensor's frequency.

PROCEDURE**SECTION V. MAINTENANCE****11.5.1 INTRODUCTION**

This section provides the preventive and corrective maintenance procedures for the Freezing Rain Sensor. Preventive maintenance consists of inspecting and cleaning (if necessary) the sensor. Corrective maintenance consists of fault isolation using the ASOS freezing rain maintenance page, removing and replacing faulty FRU's.

11.5.2 PREVENTIVE MAINTENANCE

The freezing rain sensor is inspected and the probe is cleaned if necessary every 90 days. Table 11.5.1 provides the procedure for sensor inspection and cleaning. The probe is cleaned only when it is contaminated with foreign material such as dirt, oil, fingerprints, etc. If environmental conditions are acceptable, the output frequency of the sensor is checked. If the output frequency is out of tolerance, the sensor must be replaced.

11.5.3 CORRECTIVE MAINTENANCE

Corrective maintenance of the freezing rain sensor consists of troubleshooting failures, removal and replacement of faulty sensors. In order to communicate with the sensor for troubleshooting, the maintenance technician must connect a laptop computer to the sensor. A separate procedure is provided to use the laptop computer with the freezing rain sensor.

11.5.3.1 Using the Laptop Computer With the Freezing Rain Sensor. in order to communicate with the sensor, the maintenance technician must use the laptop computer. Table 11.5.2 provides the procedure to set up the laptop computer to communicate with the sensor. Paragraph 11.4.3 provides detailed descriptions of individual sensor commands. (In Paragraph 11.4.3.1 Delete: Z5 Field Calibration).

11.5.3.2 Troubleshooting. The FREEZING RAIN maintenance page at the OID is the primary troubleshooting tool for the freezing rain sensor. Although diagnostic commands can be issued directly from the laptop computer, these commands provide no additional information - other than what is displayed on the OID. Table 11.5.3 provides a summary of troubleshooting actions for different failure indications. Table 11.5.4 provides additional troubleshooting steps for heater failures. The heater checks should be performed only after a heater failure is indicated on the freezing rain maintenance page (or by a Z1 or Z3 command) or if a "no response" condition occurs after a Z3 command is issued.

11.5.3.3 Frequency Verification. The freezing rain sensor will not be field calibrated. The freezing rain sensor should be replaced only when sensor F1 frequency is less than 39,985 hertz or greater than 40,015 hertz. Frequency verification may be performed only when the probe assembly is clean and dry and when environmental conditions are acceptable. Calibration should not be performed. Frequency verification can not be performed under any of the following conditions:

- a. When ice, snow, or liquid is visible on the probe or at the base of the probe or when the probe is dirty. These substances cause the frequency or the probe to decrease.
- b. When ambient temperature is below -10 °C (14 °F) or above +10°C (50°F). Temperatures outside this range cause contraction or expansion of the metallic probe, thereby modifying its frequency.
- c. Within 20 minutes of a Z3 request. A Z3 request initiates a de-ice cycle and the probe needs time to return to ambient temperature.
- d. More than once every 90 days. More frequent calibration under normal operating conditions is unnecessary.

11.5.4 FRU REMOVAL AND REPLACEMENT

Removal and installation procedures identified on the following chart by table number are provided to facilitate safe and efficient removal of sensor FRU's.

<u>Unit to be replaced</u>	<u>Table</u>
Electronics enclosure	11.5.6
Electronics Processor Board	11.5.7
Probe Assembly	11.5.8
Fiberoptic Module	11.5.9

Table 11.5.1 Freezing Rain Sensor Inspection and Cleaning

Step	Procedure
------	-----------

Tools and Materials Required:
 Soft cotton cloth
 Isopropyl alcohol (ASN 052-C-12)
 Laptop computer with PROCOMM Plus installed
 Laptop interface (Y-shaped) cable
 Large flat-tipped screwdriver
 No. 1 Phillips screwdriver

WARNING

Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located inside DCP equipment cabinet) supplying power to sensor are set to off (right) position.

- 1 Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (right) position. The freezing rain sensor circuit breaker module will be labeled.

WARNING

Freezing rain sensor probe assembly will be hot if sensor recently completed a de-ice cycle. Ensure that probe assembly has cooled before cleaning probe.

- 2 At freezing rain sensor, inspect surface or probe for contaminants such as dirt, oil, finger prints, etc. If any contaminants are present, clean probe using isopropyl alcohol and soft cotton cloth.
- 3 Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to on (left) position.
- 4 Check Sensor Frequency using either REVUE-SENSOR-12HR page or OID or Laptop computer (Z1 Command).

NOTE

If temperature is out of range, frequency tolerance (± 15 hertz) may not be applicable.

Table 11.5.1 Freezing Rain Sensor Inspection and Cleaning - CONT

Step	Procedure
5	If ambient temperature is 0 - 10 °C to + 10 °C (14 to 50 °F), verify that frequency is 40,000 ± 15 hertz. If frequency is out of tolerance, remove and replace freezing rain sensor in accordance with paragraph 11.5.6.

Table 11.5.2 Using the Laptop Computer With the Freezing Rain Sensor

Step	Procedure
<p>Tools Required:</p> <p>Laptop computer with PROCOMM Plus installed</p> <p>Laptop interface (Y-shaped) cable</p> <p>Laptop null cable</p> <p>Large flat-tipped screwdriver</p> <p>No. 1 Phillips screwdriver</p> <p>INITIAL SETUP PROCEDURE</p>	
1	Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (right) position.
<p><u>WARNING</u></p> <p>Probe Assembly A1A1 will be hot if sensor recently completed a de-ice cycle. Ensure that probe assembly has cooled before proceeding to step 2.</p>	
2	Using flat-tipped screwdriver, loosen four captive bolts securing access door and open door. Door is hinged to enclosure.
3	Using No. 1 Phillips screwdriver, disconnect DB-9 connector from fiberoptic module inside electronics enclosure.
4	Using laptop computer null cable and interface (Y-shaped) cable, connect RS-232C (COM1) port of laptop computer to DB-9 connector removed from fiberoptic module.
5	Turn on laptop computer and initialize PROCOMM Plus program. After program initializes, press any key to enter terminal mode (blank) screen.
6	Using ALT-S command (setup facility), set up the following terminal options: <ul style="list-style-type: none"> a. Terminal emulation: VT220 b. Duplex: FULL c. Soft flow control (XON/XOFF) : OFF d. Hard flow control (CTS/RTS) : OFF e. Line wrap: OFF

Table 11.5.2 Using the Laptop Computer With the Freezing Rain Sensor - CONT

Step	Procedure
f.	Screen scroll: ON
g.	CR translation: CR
h.	BS translation: NON-DESTRUCTIVE
i.	Break length (milliseconds): 035
j.	Enquiry: OFF
k.	EGA/VGA true underline: OFF
l.	Terminal width: 80
m.	ANSI 7 or 8 bit commands: 8 bit
7	Press ESC key to exit to terminal mode (blank) screen.
8	Using ALT-P command (line/port option), set current settings as follows:
a.	Baud rate: 2400 or 9600 (depending on modem used)
b.	Parity: NONE
c.	Data bits: 8
d.	Stop bits: 1
e.	Port: COM1
9	Press ESC key to exit to terminal mode (blank) screen.
10	Set laptop computer CAPS LOCK to ON.
11	Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to on (left) position.

NOTE

After a power interruption, the freezing rain sensor takes 30 seconds to initialize and an additional 15 seconds to calculate and average frequency. If a Z1 command is issued within 30 seconds of power-on, the sensor will not respond. If the sensor fails to respond to any Z command, allow an additional 30 seconds and reissue the command.

Table 11.5.2 Using the Laptop Computer With the Freezing Rain Sensor - CONT

Step	Procedure
12	The freezing rain sensor is now available for legal commands from the laptop computer. Refer to paragraph 11.4.3 for detailed descriptions of sensor commands and for specific restrictions on their use.

TEARDOWN

- 1 At laptopcomputer, press ALT-X (exit) to exit PROCOMM Plus.
- 2 Turn off laptop computer.
- 3 Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (right) position.
- 4 Disconnect cables between laptop computer and freezing rain sensor.
- 5 Using No. 1 Phillips screwdriver, connect freezing rain sensor DB-9 connector to fiberoptic module.
- 6 Using large flat-tipped screwdriver, close and secure freezing rain sensor access door.
- 7 Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to on (left) position.

Table 11.5.3 Freezing Rain Sensor Troubleshooting

Symptom	What To Do
Sensor does not respond	<p>Connect laptop computer and issue Z1 command.</p> <p>If sensor responds, perform fiberoptic module test (paragraph 1.5.3.3)</p> <p>If sensor fails to respond, replace sensor.</p>
PROBE STATUS failure	Replace sensor.
ELECTRONICS STATUS failure	Replace Sensor.
HEATER STATUS failure	<p>Perform heater resistance test (table 11.5.4)</p> <p>If heater resistance is out of tolerance, replace sensor.</p> <p>If heater resistance is within tolerance, replace sensor.</p>

Table 11.5.4 Probe Assembly Heater Troubleshooting

Step	Procedure
	<p>Tools and Materials Required:</p> <p>Large flat-tipped screwdriver</p> <p>Tweezers</p> <p>Digital Multimeter</p>
	<p><u>WARNING</u></p> <p>Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located in DCP) supplying power to sensor are set to off (right) position.</p>
1	Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (tight) position.
	<p><u>WARNING</u></p> <p>Probe Assembly A1A1 will be hot if sensor recently completed a de-ice cycle. Ensure that probe assembly has cooled before proceeding to step 2</p>
2	Using flat-tipped screwdriver, loosen four captive bolts securing cover to sensor and open cover. Cover is hinged to enclosure.
	<p>CAUTION</p> <p>Use caution when removing probe connectors. Heater on Electronics Processor board may be damaged if too much side pressure is exerted.</p>
3	Using tweezers, disconnect probe assembly electrical connectors J3 and J4 from Electronics Processor board. (Refer to figure 11.1.2). To disconnect connector J4, press latch and pull connector straight out.
4	Using digital multimeter, measure resistance between pins 1 and 2 of connector J4. Verify that resistance is 42 ± 5 ohms. If resistance is out of tolerance, replace sensor. If resistance is within tolerance, replace sensor.

Table 11.5.5 Freezing Rain Sensor Calibration

Delete Table 11.5.5

Table 11.5.6 Electronics Enclosure Removal and Installation

Step	Procedure
------	-----------

REMOVAL

Tools and Materials Required:

Flat-tipped screwdriver

7/16- inch wrench

Large pliers (12 inch, 1-1/4 inch capacity curved jaw)

3/16-inch hex key wrench

WARNING

Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located in DCP) supplying power to sensor are set to off (right) position.

NOTE

Electronics enclosure replacement should be accomplished only when environmental conditions are as specified for field verification, otherwise the unit cannot be field-verified immediately after replacement.

- 1 Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (right) position.

WARNING

Probe Assembly A1A1 will be hot if sensor recently completed a de-ice cycle. Ensure that probe assembly has cooled before proceeding to Step 2.

- 2 Place plastic probe cap protective cover over probe assembly.
- 3 Using flat-tipped screwdriver, loosen four captive bolts securing sensor access door and open door. Door is hinged to enclosure.

CAUTION

Electronics Processor Board A1A2 is a Class I ESD component. To Avoid damage to Electronics Processor board, use proper ESD Handling procedures, including the use of a ground strap, when performing the following steps.

Table 11.5.6 Electronics Enclosure Removal and Installation - CONT

Step	Procedure
4	Remove two fiberoptic cables from underneath fiberoptic module by turning counterclockwise (ccw). Install protective plastic covers over fiberoptic connectors.
5	Using small flat-tipped screwdriver, release catches holding plastic cover over ac terminal board connector J1. Remove plastic cover.
6	Using flat-tipped screwdriver, remove five ASOS power and chassis ground wires from terminal board connector J1. Do not disconnect sensor chassis ground wire from terminal No. 3. After removing ASOS wires and fiberoptic cables, reinstall terminal screws.
7	Install protective plastic cover over ac terminal board connector J1.
8	Using 7/16-inch wrench, remove pedestal ground wire from ground stud located at bottom right of enclosure.
9	Using large pliers, remove flexible conduit from base of electronics enclosure. Carefully pull wires and fiberoptic cables out of enclosure.
10	Using large flat-tipped screwdriver, close and secure freezing rain sensor access door.
11	While supporting electronics enclosure and using 3/8-inch hex key wrench, loosen three captive screws on mounting pole behind enclosure. When enclosure is free from screws, carefully lift enclosure off mounting pole.

INSTALLATION

Tools and Materials Required:

Flat-tipped screwdriver
 7/16-inch wrench and torque driver
 Large pliers
 3/8-inch hex key wrench and torque driver

WARNING

Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located in DCP) supplying power to sensor are set to off (right) position.

Table 11.5.6 Electronics Enclosure Removal and Installation - CONT

Step	Procedure
------	-----------

NOTE

Electronics enclosure replacement should be accomplished only when environmental conditions are as specified for Frequency verification (refer to paragraph 11.4.3.6); other wise, the unit cannot be field frequency verified immediately after replacement.

- 1 Ensure that curcuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet are set to off (right) position. Circuit breaker module will be labeled.
- 2 Ensure that protective tube is installed over Probe Assembly A1A1 of replacement enclosure.
- 3 Position electronics enclosure on mounting pole.
- 4 While supporting electronics enclosure and using 3/8-inch hex key wrench, secure enclosure to pole by tightening three captive bolts. Using torque driver, torque bolts to 45 inch-pounds.
- 5 Using flat-tipped screwdriver, loosen four captive bolts securing sensor access door and open door. Door is hinged to enclosure.
- 6 Route ac power wiring and fiberoptic cables through access hole in bottom of electronics enclosure.
- 7 Using large pliers and hardware supplied, connect flexible conduit to electronics enclosure.
- 8 Using 7/16-inch wrench, remove sensor-supplied nut from ground stud located at bottom right of enclosure. (Refer to figure 11.1.2.) Use nut to connect sensor pedestal 10 AWG ground wire to ground stud. Do not torque nut more than 7 foot-pounds.

CAUTION

Electronics Processor Board A1A2 is a Class I ESD component. To Avoid damage to Electronics Processor board, use proper ESD Handling procedures, including the use of a ground strap, when performing the following steps.

- 9 Using small flat-tipped screwdriver, release catches holding plastic cover over ac terminal board connector J1. Remove plastic cover.

EHB-11
Issuance 96-

Table 11.5.6 Electronics Enclosure Removal and Installation - CONT

Step	Procedure																		
10	Using flat-tipped screwdriver, connect ac power wiring to terminal board connector J1 as follows:																		
	<table><tr><th><u>Wire color</u></th><th><u>Terminal</u></th><th><u>Function</u></th></tr><tr><td>Black</td><td>J1-1</td><td>120 vac (electronics)</td></tr><tr><td>White</td><td>J1-2</td><td>Neutral (electronics)</td></tr><tr><td>Green</td><td>J1-3</td><td>Chassis ground</td></tr><tr><td>Red</td><td>J1-4</td><td>120 vac (heater)</td></tr><tr><td>Yellow</td><td>J1-5</td><td>Neutral (heater)</td></tr></table>	<u>Wire color</u>	<u>Terminal</u>	<u>Function</u>	Black	J1-1	120 vac (electronics)	White	J1-2	Neutral (electronics)	Green	J1-3	Chassis ground	Red	J1-4	120 vac (heater)	Yellow	J1-5	Neutral (heater)
<u>Wire color</u>	<u>Terminal</u>	<u>Function</u>																	
Black	J1-1	120 vac (electronics)																	
White	J1-2	Neutral (electronics)																	
Green	J1-3	Chassis ground																	
Red	J1-4	120 vac (heater)																	
Yellow	J1-5	Neutral (heater)																	
11	Install protective plastic cover over ac terminal board connector J1.																		
12	Remove plastic covers from fiberoptic cables and connect transmit (TX) cable to TRANSMIT connector of fiberoptic module and receive (RX) cable to RECEIVE connector.																		
13	Remove protective cover from probe assembly.																		

Table 11.5.7 Electronics Processor Board Removal and Installation

Delete Table 11.5.7

Table 11.5.8 Probe Assembly Removal and Installation

Delete Table 11.5.8

Table 11.5.9 Fiberoptic Module Removal and Installation

Step	Procedure
REMOVAL	
<p>Tools and Materials Required:</p> <p>Flat-tipped screwdriver</p> <p>Small flat-tipped screwdriver</p> <p>No. 1 Phillips screwdriver</p>	
<u>WARNING</u>	
<p>Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located in DCP) supplying power to sensor are set to off (right) position.</p>	
1	Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to off (right) position.
2	Using flat-tipped screwdriver, loosen four captive bolts securing access door to sensor and open door. Door is hinged to enclosure.
3	Using No.1 Phillips screwdriver, loosen two retaining screws on DB-9 connector located on top of fiberoptic module. Remove DB-9 connector.
4	Remove two fiberoptic cables from underneath fiberoptic module by turning ccw. Install protective plastic covers over fiberoptic connectors.
5	Using small flat-tipped screwdriver, remove four screws securing fiberoptic module to mounting plate.

Table 11.5.9 Fiberoptic Module Removal and Installation - CONT

Step	Procedure
<p>INSTALLATION</p> <p>Tools and Materials Required: Flat-tipped screwdriver Small flat-tipped screwdriver No. 1 Phillips screwdriver</p>	
<p><u>WARNING</u></p> <p>Death or severe injury may result if power is not removed from sensor prior to maintenance activities. Ensure that circuit breakers (located in DCP) supplying power to sensor are set to off (right) position.</p>	
1	Ensure that circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet are set to off (right) position.
2	With DB-9 connector toward the front (RECEIVE) and using small flat-tipped screwdriver, install four screws to secure fiberoptic module to mounting plate.
3	Remove plastic covers from fiberoptic connectors and connect transmit (TX) cable to TRANSMIT connector and receive (RX) cable to RECEIVE connector.
4	Install signal cable on fiberoptic module DB-9 connector. Using No. 1 Phillips screwdriver, tighten two retaining screws.
5	Using large flat-tipped screwdriver, close and secure freezing rain sensor access door.
6	Set circuit breakers on freezing rain sensor circuit breaker module inside DCP equipment cabinet to on (left) position.

Remove Section V of Technical Manual S100 ASOS Maintenance Manual and replace with these pages.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None. Report the installation of Freezing Rain sensor.

Acting Chief, Engineering Division

EHB-11
Issuance 96-

Autobalance Module Threshold Resistor (R5)

GENERAL

The autobalance module for the ASOS hygrothermometers (1088 and refurbished 1063 versions) differs from the autobalance module for the station HO83 hygrothermometers because of changes early in the ASOS implementation.

The modules differ in the threshold resistor (R5) that determines the sensitivity of the autobalance function to dirt on the mirror. The ASOS system has higher sensitivity to dirt. Impact on ASOS hygrothermometer operation is minimal for the following reasons:

- A. The autobalance module is a low replacement frequency item (all ASOS hygrothermometers are shipped with the correct module).
- B. The effect of an incorrect autobalance in the ASOS system is to lower its sensitivity to dirt on the mirror. Lower sensitivity results in a reduced compensation for dirt. The lower compensation causes known recognizable symptoms that are usually detected by the data quality algorithms. The impact will be less than disconnecting the autobalance module that has been previously done for a significant time.

PROCEDURE

1. The following actions are being taken.

- A. Two different autobalance modules will be stocked: one for the ASOS hygrothermometers (R5 = 200K ohms) and one for the remaining station HO83 hygrothermometers (R5 = 249K ohms).
- B. The ASOS hygrothermometer autobalance stock will be maintained as:

ASN: S100-2MT4A1R7
NSN: 6625-01-423-1323
Vendor P/N: 1063-600
R5 resistor: 200K ohms.

2. The following actions are required at each ASOS site:

- A. On the next trip to each site, inspect the resistor R5 for its value. Reference the autobalance printed circuit Figure 1 for location of R5. Use the ASOS Site Technical

Manual (STM), Table 5.5.13 for the autobalance module removal and Figure 1 for location of R5.

- B. The resistor is marked with the resistance value. If marked with 2003xx, the value is a 200K ohm resistor and is correct. If the resistor is positioned so that the resistance value is not visible, use a multi meter to determine the value. A resistance reading close to 200K ohms is correct. A reading closer to 249K ohms is incorrect.
- C. If it is determined that the correct R5 resistor is installed, reinstall the autobalance module following the ASOS STM, Table 5.5.13.
- D. If it is determined that the incorrect R5 resistor is installed, return the autobalance module to NLSC and replace with the correct module as described in the ASOS STM.
- E. Inspect the spares kit and return any autobalance modules found to NLSC. Most kits did not include the autobalance module.
- F. Any ASOS hygrothermometer exhibiting dew points more than 2° F higher than ambient temperature may have an incorrect autobalance module installed. This is a condition detected by the ASOS data quality algorithms or an inspection of the hygrothermometer data. Such an occurrence may, based on operational considerations, be cause for a special trip to the site to inspect the autobalance module.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



Chief, Engineering Division

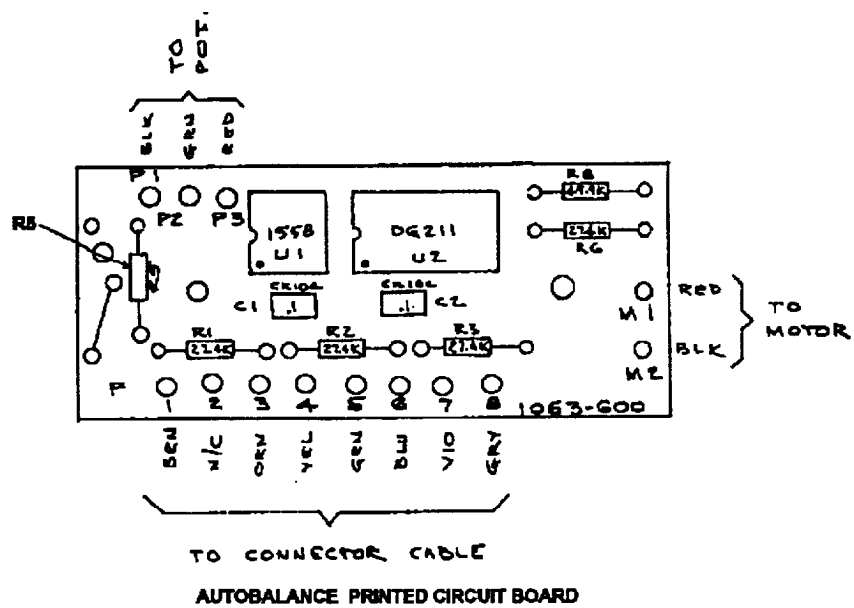


FIGURE 1

ASOS MAINTENANCE NOTE 22 (for Electronics Technicians)

Engineering Division

W/OSO321:AJW

Frozen Wind and Direction Bottles

GENERAL

This maintenance note provides instructions for ice removal from frozen wind bottles. Ice removal has caused damage to bottle housings, cups, vanes, and bearings. The procedures described below will reduce bottle damage. The use of WD-40 and other oils as a bearing lubricant for wind speed and direction bottles, will cause bearing deterioration. The bearings used in the wind bottles are lubricated with a product which is not compatible with petroleum lubricants and MUST NOT be lubricated by technicians.

PROCEDURE

This section provides procedures for removing ice from the wind speed and direction bottles, cups and vanes. Preventive maintenance consists of inspecting and cleaning (if necessary) the sensor.

As per section 4.5.2.6 Cleaning and Lubrication in the ASOS Site Technical Manual S100, the only cleaning required is to remove any debris from the wind sensor. Because bearings are sealed, there is no requirement for lubrication.

Technicians should remove ice from frozen wind speed and direction bottles, cups, and vanes by using the following method.

1. Lower the tower using the procedure in the ASOS Site Technical Manual S100 (page 4-44, table 4.510).
2. DO NOT CHIP the ice off of the wind speed or direction bottles, cups, or vanes.
3. If the ice did not break off when the tower was lowered, remove the wind and direction bottles that have ice on them.
4. Place the removed bottles in a warm place to thaw out. (i.e., your van or car to thaw them out).
5. After bottles have thawed, dry them thoroughly to prevent later refreezing. Remove cups and vanes and dry inside the shroud.
6. Clean and inspect for damage.
7. Replace wind and direction bottles on tower.

8. Raise the tower using the procedure in the ASOS Site Technical Manual S100 (page 4-45, table 4.5.10)
9. Clear any maintenance flags caused by removing and replacing the wind bottles. Return the ASOS to its normal operating condition.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

Report corrective action on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AWIND.


Acting Chief, Engineering Division

ASOS MAINTENANCE NOTE 23 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM/MGC

Dew Point Sensor Assembly Improvements

GENERAL

The Engineering Design Branch is developing improvements to the Automated Surface Observing System (ASOS) hygrothermometer dew point sensor. The efforts are continuing. A full scale evaluation of the final version of the new sensor will be performed to demonstrate its performance and provide data for a decision to implement. The major goals of the effort are to significantly reduce the corrosion problems and mirror icing problems.

A major subset the improvements serve is to reduce corrosion and improve functional performance without impacting sensor design. These changes can best be described as improvements in the current design and manufacturing processes and materials. The improvements are: the optical block is manufactured to tighter tolerances and made from gray PVC rather than Delrin; the optical block mount is made with a slot to permit precise positioning of the optics with respect to the mirror; phototransistors selected based on sensitivity; and the whole board is now conformal coated. These improvements have been applied to approximately 60 logistics replacement dew point sensors.

The agency stock number (ASN) for the interim sensor is S100-2MT4A1A1-2. This sensor will be stocked separately from existing sensors. When ordering the S100-2MT4A1A1-2 sensor NLSC may substitute a S100-2MT4A1A1-1 sensor. This is acceptable since the sensors are interchangeable.

PROCEDURE

Maintenance of the S100-2MT4A1A1-2 sensor is the same as the existing sensor S100-2MT4A1A1-1 except as follows:

Mirror Cleaning:

Clean the S100-2MT4A1A1-2 sensor using the current procedure, but omit the step that uses lacquer thinner (ASOS Site Technical Manual S100, Table 5.5.2, Step 10). The lacquer thinner can dissolve the conformal coating that is now adjacent to the mirror and spread it onto the mirror. Subsequent cleaning with the alcohol will not remove the conformal coating contaminates from the mirror. The contaminated mirror will have poor performance including icing. Continue to use the lacquer thinner for the S100-2MT4A1A1-1 sensor.

Optical Loop Adjustment:

For the S100-2MT4A1A1-2 sensor only insert the attached pages 5-47A through 5-47D in, Chapter 5 "Temperature and Dewpoint Sensor," Section V Maintenance of the ASOS Site Technical Manual S100.

The revised procedure adjusts the optical loop using the SD LEVEL LED and the S1 LEVEL LED with a dry mirror. This procedure has been used in the past. It provides the following advantages:

1. It is more easily, quickly and reliably completed.
2. It provides a thinner dew layer that reduces the rate of mirror icing.
3. It provides more consistent autobalance operation.

We welcome your comments on its use and effectiveness.

Make a pen-and-ink change to amend the optical loop adjustment as follows:

ASOS Site Technical Manual S100, Table 5.5.3.

1. Change step 18 to read "Ensure that CALIBRATOR switch is set to OPR position".
2. Add pen-and-ink change for S100-2MT4A1A1-1 only at top of Table 5.5.3.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



Acting Chief, Engineering Division

Use this procedure for S100-2MT4A1A1-2
Table 5.5.3. Model HO83 Temperature/Dewpoint Sensor optical
Loop Adjustment

Step	Procedure
------	-----------

Tools required:
Small flat-tipped screwdriver
Large flat-tipped screwdriver

CAUTION

Internal components of aspirator are delicate and must be handled with care. Excessive mechanical shocks can cause permanent damage.

1. Clean aspirator using the procedure in table 5.5.2. Omit step 10 (Lacquer thinner). Do not reapply ac power.
2. Install sensor / fan assembly in aspirator housing and secure with a captive screw.
3. Using large flat-tipped screwdriver, open temperature/dewpoint sensor transmitter access door.
4. Reset autobalance variable resistor to zero.
5. Apply power to sensor by setting POWER switch to **ON** (up) position.

Use this procedure for S100-2MT4A1A1-2
Table 5.5.3. Model HO83 Temperature/Dewpoint Sensor Optical
Loop Adjustment - CONT

Step	Procedure
------	-----------

NOTE

The adjustments made in this section must be performed with a completely dry mirror. Ensure that mirror is dry by heating it for a minimum of 1 minute initially, then keeping the mirror temperature above ambient (TA) using the HEAT position of the TEST switch. The measurements and adjustments described in steps 6 and 7 must not be made while heating the mirror. Therefore, it is necessary to monitor the mirror temperature (TD), via the seven-segment display, and heat as necessary to ensure that TD is greater than TA, making the measurements and adjustments between the heating cycles.

6. Turn SD GAIN variable resistor (R21) until SD LEVEL LED (CR5) just goes on (threshold level).
7. Adjust SI GAIN variable resistor (R22) until SI LEVEL LED (CR9) goes on, then back off SI GAIN until SI LEVEL LED just goes off.
8. Ensure that CALIBRATOR switch is set to OPR position.
9. Using large flat-tipped screwdriver, close and secure temperature/dewpoint sensor transmitter access door.
10. On sensor status page at OID, turn on report processing for temperature/dewpoint sensor.

Use this procedure for S100-2MT4A1A1-2
Table 5.5.4. Model 1088 Temperature/Dewpoint Sensor Optical
Loop Adjustment

Step	Procedure
------	-----------

Tools required:
Small flat-tipped screwdriver
Large flat-tipped screwdriver

CAUTION

Internal components of aspirator are delicate and must be handled with care. Excessive mechanical shocks can cause permanent damage.

1. Clean aspirator using the procedure in table 5.5.2. Omit step 10 (lacquer thinner) Do not reapply ac power.
2. Install sensor/fan assembly in aspirator housing and secure with a captive screw.
3. Using large flat-tipped screwdriver, open temperature/dewpoint sensor transmitter access door.
4. Reset autobalance variable resistor to zero.
- 5 Apply power to sensor by setting POWER switch to ON (up) position.

Use this procedure for S100-2MT4A1A-2
Table 5.5.4. Model 1088 Temperature/Dewpoint Sensor Optical
Loop Adjustment - CONT

Step	Procedure
------	-----------

NOTE

The adjustments made in this section must be performed with a completely dry mirror. Ensure that mirror is dry by heating it for a minimum of 1 minute initially, then keeping the mirror temperature above ambient (TA) using the HEAT position of the MODE switch. The measurements and adjustments described in steps 6 and 7 must not be made while heating the mirror. Therefore, it is necessary to monitor the mirror temperature (TD), via the seven-segment display, and heat as necessary to ensure that TD is greater than TA, making the measurements and adjustments between the heating cycles.

6. Turn SD GAIN variable resistor (R21) until SD LEVEL LED (CR5) just goes on (threshold level).
7. Adjust SI GAIN variable resistor (R22) until SI LEVEL LED (CR9) goes on, then back off SI GAIN until SI LEVEL LED just goes off.
8. Ensure that MODE switch is set to OPR position.
9. Using large flat-tipped screwdriver, close and secure temperature/dewpoint sensor transmitter access door.
10. On sensor status page at OID, turn on report processing for temperature/dewpoint sensor.

ASOS MAINTENANCE NOTE 24 (for Electronics Technicians)

Engineering Division
W/OSO321:BGM/AJW

4-Wire to 2-Wire Telephone Circuit Remote for ASOS Equipment

GENERAL

There have been complaints from the field about the local telephone company incorrectly wiring circuits for ASOS equipment. This maintenance note provides a wiring diagram (figure 1) for a full duplex data circuit with a 2-wire hand off at both ends of the circuit. The wiring diagram is intended as an aid for the ASOS technician. Not all telephone companies use the same wiring methods. The diagram should help the technician to determine if the wiring is correct when an OID, VDU, or printer is installed. SMI has found that a 4-wire full duplex line with the 2-wire hand off should be ordered, so that the OID can operate without experiencing telco line problems. The function of a hybrid circuit is to interface a 2-wire circuit to a 4-wire circuit to permit full duplex operation.

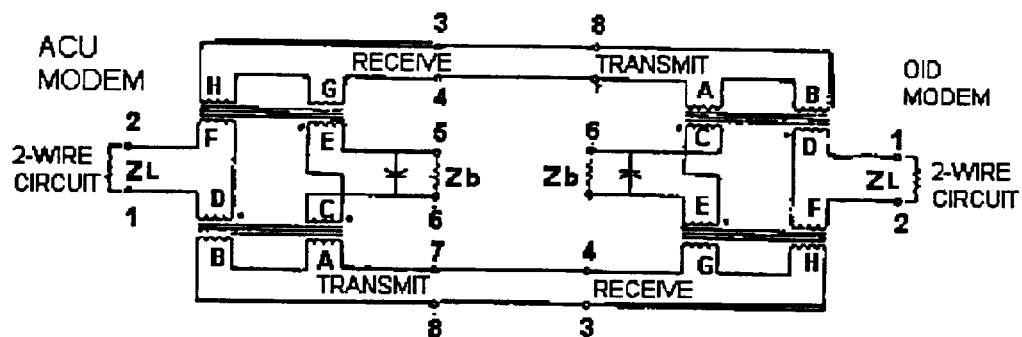
EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.


Acting Chief, Engineering Division



**HYBRID CIRCUIT
FIGURE 1**

Nodes 1 and 2, represent the punch down block at the Demarc in figure 1

Hygrothermometer Dew Point Sensor Mirror and Optical Loop Adjustment Maintenance.

GENERAL

Maintenance Note 25 makes major changes in the maintenance of the hygrothermometer dew point sensor mirror cleaning and the optical loop adjustment. The changes described in this maintenance note apply to ALL ASOS hygrothermometer dew point sensor assemblies ASN S100-2MT4A1A1-1 and S100-2MT4A1A1-2. The changes have been verified by a significant amount of testing and have been approved by the Hygrothermometer Working Group. The changes are:

1. Two Step Cleaning:

Two step cleaning refers to the current cleaning method without the lacquer thinner step. It originated with the S100-2MT4A1A1-2 (-2 sensor). The -2 sensor has full-board conformal coating. The lacquer thinner can dissolve conformal coating that is adjacent to the mirror and spread it onto the mirror. Subsequent cleaning with alcohol will not remove the conformal coating contaminants from the mirror. The contaminated mirror will have poor performance, including icing.

2. Mirror Waxing:

This maintenance note provides a procedure for the application of wax to the dew point sensor mirror. The waxing of the mirror provides two benefits for the hygrothermometer dew point sensor mirror.

- a. Waxing provides the mirror a surface having a very high surface tension that promotes a dew layer that has an even distribution of very small water droplets. Such a layer prevents large water droplets and "puddles" which ultimately lead to mirror icing.
- b. Waxing provides protection for the mirror surface that will reduce corrosion and its effect on the life of the mirror and the performance of the system.

PROCEDURE

Mirror Cleaning:

The wax that must be used is: **KIT CARNAUBA CAR WAX** manufactured by Northern Labs, Inc. This is a paste type automotive wax with a high proportion of carnauba wax that has no abrasives. The wax is to be procured locally as an expendable item. This wax will not be stocked at the National Logistics Supply Center. Follow the instructions on the container of the wax for storage in a cold climate.

NOTE: In a cold environment this waxing procedure should be done in a warm enclosed area.

- a. The mirror should be waxed every time that it is cleaned and should not be waxed except after cleaning.
- b. Clean the mirror following the instructions in the ASOS Site Technical Manual S100, page 5-40, Table 5.5.2; omit step 10 of this procedure.
- c. Use a clean swab to apply a small amount of wax to the mirror surface. Use a circular motion to ensure that a thin even coat of the wax is applied to the mirror surface. Use care to prevent wax from getting into the optic block holes for the LED and photo transistors.
- d. Allow the wax to dry to a hazy finish.
- e. Use a clean swab to buff the surface to a smooth shiny surface, free of any excess wax.
- f. Use another clean swab to clean up any excess wax around the mirror such as on the edge of the card around the mirror and on the optical block. Confirm that the optic block holes for the LEDs and photo transistors do not have wax blockage.
- g. Continue with the procedure in the Site Technical Manual following the mirror cleaning procedures.

3. Optical Loop Adjustment

This maintenance note revises the optical loop adjustment for all ASOS dew point sensors. Use the attached revised table 5.5.3 and table 5.5.4 for the HO83 and 1088 respectively.

The revised procedure adjusts the optical loop using the SD LEVEL LED and the SI LEVEL LED with a dry mirror. This procedure provides the following advantages over current instructions:

- a. It is easily, quickly, and reliably completed;
- b. It provides a thinner dew layer that reduces the rate of mirror icing; and
- c. It provides more consistent autobalance operation.

EFFECT ON OTHER INSTRUCTIONS

Remove pages 5-47A through 5-47D in the ASOS Site Technical Manual (STM) S100. Replace the removed pages with Appendix A, located in this Maintenance Note.

REPORT MAINTENANCE ACTION

None.



John McNulty
Chief, Engineering Division

Attachments:
Appendix A

Table 5.5.4. Model 1088 Temperature/Dewpoint Sensor Optical Loop Adjustment

Step	Procedure
------	-----------

Tools required:
 Small flat-tipped screwdriver
 Large flat-tipped screwdriver

CAUTION

Internal components of the aspirator are delicate and must be handled with care. Excessive mechanical shocks can cause permanent damage.

1. Clean the aspirator using the procedure in table 5.5.2. Omit step 10 (Lacquer thinner) Do not reapply ac power.
2. Install the sensor/fan assembly in aspirator housing and secure with a captive screw.
3. Using large flat-tipped screwdriver, open the temperature/dewpoint sensor transmitter access door.
4. Reset the autobalance variable resistor to zero.
5. Apply power to the sensor by setting the POWER switch to **ON** (up) position.

Table 5.5.4. Model 1088 Temperature/Dewpoint Sensor Optical
Loop Adjustment - Con.,

Step	Procedure
------	-----------

NOTE

The adjustments made in this section must be performed on a completely dry mirror. Ensure that the mirror is dry by heating it for a minimum of 1 minute initially, then keeping the mirror temperature above ambient (TA) by using the HEAT position of the MODE switch. The measurements and adjustments described in steps 6 and 7 must not be made while heating the mirror. Therefore, it is necessary to monitor the mirror temperature (TD), via the seven-segment display, and heat as necessary to ensure that TD is greater than TA, making the measurements and adjustments between the heating cycles.

6. Turn **SD GAIN** variable resistor (R21) CCW until **SD LEVEL LED** (CR5) goes **OFF**, then turn **CW** until **SD LEVEL LED** just goes ON..
7. Adjust **SI GAIN** variable resistor (R22) until **SI LEVEL LED** (CR9) goes on, then back off **SI GAIN** until **SI LEVEL LED** just goes off.
8. Ensure that the **MODE** switch is set to **OPR** position.
9. Using the large, flat-tipped screwdriver, close and secure the temperature/dewpoint sensor transmitter access door.
10. On the sensor status page at the OID, turn on report processing for the temperature/dewpoint sensor.

Table 5.5.3. Model HO83 Temperature/Dewpoint Sensor Optical Loop Adjustment

Step	Procedure
------	-----------

Tools required:
 Small flat-tipped screwdriver
 Large flat-tipped screwdriver

CAUTION

The internal components of the aspirator are delicate and must be handled with care. Excessive mechanical shocks can cause permanent damage.

1. Clean the aspirator using the procedure in table 5.5.2. Omit step 10 (lacquer thinner). Do not reapply ac power.
2. Install the sensor/fan assembly in aspirator housing and secure with a captive screw.
3. Using large flat-tipped screwdriver, open the temperature/dewpoint sensor transmitter access door.
4. Reset the autobalance variable resistor to zero.
5. Apply power to the sensor by setting POWER switch to **ON** (up) position.

Table 5.5.3. Model HO83 Temperature/Dewpoint Sensor Optical Loop Adjustment - Con.,

Step	Procedure
NOTE	
<p>The adjustments made in this section must be performed on a completely dry mirror. Ensure that the mirror is dry by heating it for a minimum of 1 minute initially, then keeping the mirror temperature above ambient (TA) by using the HEAT position of the TEST switch. The measurements and adjustments described in steps 6 and 7 must not be made while heating the mirror. Therefore, it is necessary to monitor the mirror temperature (TD), via the seven-segment display, and heat as necessary to ensure that TD is greater than TA, making the measurements and adjustments between the heating cycles.</p>	
6.	Turn SD GAIN variable resistor (R21) CCW until SD LEVEL LED (CR5) goes OFF , then turn CW until SD LEVEL LED just goes ON .
7.	Adjust SI GAIN variable resistor (RZ2) CW until SI LEVEL LED (CR9) goes ON , then turn CCW until SI LEVEL LED just goes OFF .
8.	Ensure that the CALIBRATOR switch is set to OPR position,
9.	Using large flat-tipped screwdriver, close and secure the temperature/dewpoint sensor transmitter access door.
10.	On sensor status page at the OID, turn on report processing for the temperature/dewpoint sensor.

ASOS MAINTENANCE NOTE 26 (for Electronics Technicians)

Engineering Division

W/OSO321:AJW

Freezing Rain Sensor Grounds

GENERAL

This note provides information and directions to ensure that the Freezing Rain Sensor is properly grounded. The Freezing Rain Sensor is a field replaceable unit (FRU) and should not be repaired by the technician, however, the technician can test the unit to ensure proper operation before installation. When improperly grounded, the Electronics Enclosure (case) will float to 60 volts AC and can supply up to 400 milliamps of current.

PROCEDURETesting

The technician can test the Freezing Rain Sensor before installation at a remote site. It is important that the following grounds are connected at the time of the test. If either of these grounds are not connected correctly, there can be 60 volts present on the Electronics Enclosure (case).

1. The internal ground is chassis ground and it is connected between terminals J1-3 by a green wire.
2. The second ground is the Electronics Enclosure (case) ground and it is the no. 10 American Wire Gauge (AWG) ground wire connected to the single barrel lug on the Electronics Enclosure (case).

Installation

1. At the time of installation, follow installation procedures in the ASOS Site Technical Manual S-100 (page 11-7, Table 11.2.1). Ensure that step 10/11, "Connecting the no. 10 AWG sensor ground to raceway ground strap and ground stud, " is done.
2. Ensure that the internal ground connection is made at terminal J-3 with the green wire.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



Acting Chief, Engineering Division

ASOS MAINTENANCE NOTE 27 (for Electronics Technicians)

Engineering Division

W/OSO321:AJW

Ordering and Installing ASOS Calibration Software

GENERAL

This note provides information on how to acquire the new standard ASOS calibration software and provides subsequent laptop installation instructions. The software establishes a software calibration standard for all ASOS Electronics Technicians which will reside on technicians laptop computers.

Technicians requiring items from the National Logistics Supply Center (NLSC) will either initiate an order using the Consolidated Logistics System or contact their designated regional focal point. You must have the Serial BERT software in addition to the calibration software.

PROCEDURE

Order the following item from NLSC:S100-TE318-1, ASOS Calibration Software. If a technician does not have the Serial Bert Software, also order S100-TE318.

The Calibration software is shipped on one 3.5" floppy disk. This disk (S100-TE318-1 contains the ASOS calibration menu program and associated files to execute the software calibration standard. Included in this software package are the following maintenance calibration programs:

- . Solar Noon Calculation
- . Psychrometer Calculation
- . Ceilometer Calculation
- . VSWR Calculation

The Serial BERT program (S100-TE318) is a separate piece of software. Load the Software into the laptops by using the following procedure:

1. Power up the laptop.
2. After the boot sequence validate correct time and date.
3. At the C:\DOS prompt create a directory called ASOS.

C:\>md asos

4. Insert the disk (S100-TE318-1) with the ASOS and SUN executable files in the A drive.
5. Change to the ASOS directory and copy the ASOS calibration programs and SUN executable file to the ASOS directory on the C drive.

```
C:\cd asos
C:\ASOS>copya:\asos.exe
C:\ASOS>copya:\sun.exe
```

6. After the files have been copied to the ASOS directory, create a directory called SB and log onto the new directory.

```
C:\ASOS>md sb
C:\ASOS>cd sb
```

7. Insert the disk S100-TE318 with the Serial BERT program files in the A drive.
8. Copy the Serial BERT program files contained on the disk in the A drive, to the SB subdirectory.

```
C:\ASOS\SB>copya:\*.*
```

9. Edit the AUTOEXEC.BAT file and add the ASOS and SB subdirectories in the path statement.

```
PATH=C:\ASOS;C:\ASOS\SB;%PATH%
```


10. Reboot the computer and type ASOS at the C prompt to bring up the ASOS calibration menu program.
11. Keep original disks in a safe place to be used if laptop computer needs to be reloaded.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.


Acting Chief, Engineering Division

ASOS MAINTENANCE NOTE 26 (for Electronics Technicians)

Engineering Division

W/OSO321:AJW

Freezing Rain Sensor Grounds

GENERAL

This note provides information and directions to ensure that the Freezing Rain Sensor is properly grounded. The Freezing Rain Sensor is a field replaceable unit (FRU) and should not be repaired by the technician, however, the technician can test the unit to ensure proper operation before installation. When improperly grounded, the Electronics Enclosure (case) will float to 60 volts AC and can supply up to 400 milliamps of current.

PROCEDURE

Testing

The technician can test the Freezing Rain Sensor before installation at a remote site. It is important that the following grounds are connected at the time of the test. If either of these grounds are not connected correctly, there can be 60 volts present on the Electronics Enclosure (case).

1. The internal ground is chassis ground and it is connected between terminals J1-3 by a green wire.
2. The second ground is the Electronics Enclosure (case) ground and it is the no. 10 American Wire Gauge (AWG) ground wire connected to the single barrel lug on the Electronics Enclosure (case).

Installation

1. At the time of installation, follow installation procedures in the ASOS Site Technical Manual S-100 (page 11-7, Table 11.2.1). Ensure that step 10/11, "Connecting the no. 10 AWG sensor ground to raceway ground strap and ground stud, " is done.
2. Ensure that the internal ground connection is made at terminal J-3 with the green wire.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.



Acting Chief, Engineering Division

ASOS MAINTENANCE NOTE 27 (for Electronics Technicians)

Engineering Division

W/OSO321:AJW

Ordering and Installing ASOS Calibration Software

GENERAL

This note provides information on how to acquire the new standard ASOS calibration software and provides subsequent laptop installation instructions. The software establishes a software calibration standard for all ASOS Electronics Technicians which will reside on technicians laptop computers.

Technicians requiring items from the National Logistics Supply Center (NLSC) will either initiate an order using the Consolidated Logistics System or contact their designated regional focal point. You must have the Serial BERT software in addition to the calibration software.

PROCEDURE

Order the following item from NLSC:S100-TE318-1, ASOS Calibration Software. If a technician does not have the Serial Bert Software, also order S100-TE318.

The Calibration software is shipped on one 3.5" floppy disk. This disk (S100-TE318-1) contains the ASOS calibration menu program and associated files to execute the software calibration standard. Included in this software package are the following maintenance calibration programs:

- . Solar Noon Calculation
- . Psychrometer Calculation
- . Ceilometer Calculation
- . VSWR Calculation

The Serial BERT program (S100-TE318) is a separate piece of software. Load the software into the laptops by using the following procedure:

1. Power up the laptop.
2. After the boot sequence validate correct time and date.
3. At the C:\DOS prompt create a directory called ASOS.

C:\>md asos

4. Insert the disk (S100-TE318-1) with the ASOS and SUN executable files in the A drive.
5. Change to the ASOS directory and copy the ASOS calibration programs and SUN executable file to the ASOS directory on the C drive.


```
C:\cd asos
C:\ASOS>copy a:\asos.exe
C:\ASOS>copy a:\sun.exe
```

6. After the files have been copied to the ASOS directory, create a directory called SB and log onto the new directory.

```
C:\ASOS>md sb
C:\ASOS>cd sb
```

7. Insert the disk S100-TE318 with the Serial BERT program files in the A drive.
8. Copy the Serial BERT program files contained on the disk in the A drive, to the SB subdirectory.

```
C:\ASOS\SB>copy a:\*.*
```

9. Edit the AUTOEXEC.BAT file and add the ASOS and SB subdirectories in the path statement.

```
PATH=C:\ASOS;C:\ASOS\SB;%PATH%
```

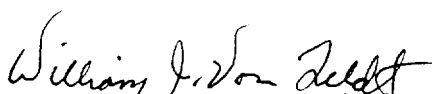
10. Reboot the computer and type ASOS at the C prompt to bring up the ASOS calibration menu program.
11. Keep original disks in a safe place to be used if laptop computer needs to be reloaded.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.


Acting Chief, Engineering Division

ASOS MAINTENANCE NOTE 28 (for Electronics Technicians)

Engineering Division
W/OSO321:BGM/AJW

Safe Operation of ASOS Freezing Rain Sensor

GENERAL

All National Weather Service freezing rain sensors had AC power removed pending the correction of the safety hazard (reference Maintenance Note 26). This maintenance note establishes proper procedures for returning the freezing rain sensor back to operational status. Analysis conducted by the freezing rain sensor manufacturer revealed that the sensor can operate safely when proper grounding techniques are employed. Visual checks of the grounds must be complete before applying power to the sensor.

PROCEDURE

NOTE:

The technician should order from NLSC a CAUTION label to be installed on the freezing rain enclosure. The ASN for the label is S100-2MT3-Label. Listed below is how the label reads:

CAUTION

This sensor requires that a proper ground be established and maintained for safe operation. DO NOT apply AC power or perform maintenance until the ground condition is verified.

The Freezing Rain Sensor is an LRU and should not be repaired by the technician. The technician can test the unit to ensure proper operation before installation.

The technician is to check all ground connections before turning on the Freezing Rain circuit breaker in the Data Collection Platform (DCP). Visually check the following grounds and verify proper connection.

THESE STEPS MUST BE FOLLOWED:

1. Check the internal chassis ground inside the freezing rain enclosure (2MT3A1); reference the Automated Surface Observing System site Technical Manual S100, Chapter 11, Page 11-3. Verify J1-3, the green wire, is tight.

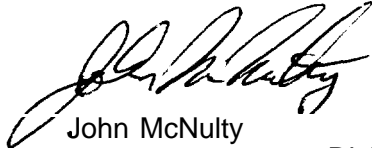
2. The second ground is the electronics enclosure (case) ground and it is the 10 American Wire Gauge (AWG) ground wire connected to the single barrel lug on the electronics enclosure (case). Check ground wire connection at the raceway ground wire. Check for corrosion on both lugs. If corrosion is detected, clean by using a wire brush.
3. The third ground is the mounting pole connected to the pedestal and provides earth ground. Check that all bolts and nuts are installed and tight.
4. After the ground connections are checked and verified, set the freezing rain circuit breaker in the DCP to the **ON** position. **Caution: Do not touch sensor case until voltage check has been completed in step 6.**
5. Go to the **REVUE-SITE-CONFIG-SENSR** page. Configure the freezing rain sensor in the appropriate position.
6. Using a Volt Ohm meter, check the AC and DC voltages between the case of the freezing rain enclosure and the 10 AWG copper wire located at the raceway. If the voltage measures more than 0.25 volts AC or DC, remove power from the freezing rain sensor by turning OFF the circuit breaker in the DCP. Call Bobby McCormick 301 713-1835 X 167 and report the problem. If the voltage is less than 0.25 volts, AC or DC, install the caution label on the freezing rain enclosure. The temperature must be greater than 40 degrees Fahrenheit before installing the label.
7. Contact the AOMC at 1-800-242-8194. Inform the AOMC of the site configured for the freezing rain sensor.
8. This completes this maintenance note.

EFFECT ON OTHER INSTRUCTIONS

Safety Alert Bulletin

REPORT MAINTENANCE ACTION

None.



John McNulty
Chief, Engineering Division

ASOS MAINTENANCE NOTE 29 (for Electronics Technicians)

Engineering Division

W/OSO321:AJ W

Accessing the ASOS Technical Information Center Home Page

GENERAL

This note provides access and password information for the new ASOS Technical Information Center Home Page on the Internet.

PROCEDURE

After accessing the internet via a browser, type in the ASOS Technical Information Center Home Page address.

<http://www.oso3.nws.noaa.gov/asos>

When the password block appears, type the following information. Both the USER NAME and PASSWORD fields must be entered in lower case:

USER NAME:	asos
PASSWORD:	asos.tech

You have now accessed the ASOS Technical Information Center Home Page.

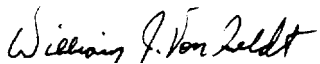
This page is protected by password so do not disseminate the password. It will be changed periodically by a maintenance note errata and will not be posted on the Homepage.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None.


for John McNulty
Chief, Engineering Division

Technical Information

GENERAL

This note provides technical information regarding three different problem areas in ASOS: Molex connectors in the Data Collection Package (DCP); a 2.4 Firmware Report Processing Error; and charging the Paroscientific pressure standard.

1. DCP Molex connector

Occasionally, the contacts in the Molex type connectors, located on the DCP power supply harness, become unseated. There are four connectors which are effected W24-P1, P2, P3, and P4. These are located between the Faraday box and the VME Cardcage. When the contacts are improperly seated, they back out of the connectors and can create a DC power or ground problem. These problems range from intermittent fail counts on the five-volt power supply to fires in the DCP. Molex type connectors W24-P1, P2, P3, and P4 must be checked to ensure that the contacts are properly locked in the connector. Remove power from the DCP and then disconnect connectors W24 - P1, P2, P3, and P4 one at a time. Gently pull each wire to see if contacts are seated. If loose, attempt to reseat the contact by pushing the wire into the back of the connector. If damaged, or the contact is crimped incorrectly, contact NRC for assistance. Reconnect W24 - P1, P2, P3, and P4, then turn the DCP ON.

2. 2.4 Firmware Report Processing Error

Version 2.4 firmware will continue to report sensor data on the 1 minute page when Report Process is turned off. Current calibration procedures require Report Processing to be turned off, to prevent any calibration data from being processed and displayed on the 1 minute page. Due to the firmware error, sensor data is still processed and causes erroneous readings. To prevent erroneous readings, technicians must use the following procedure when calibrating sensors:

- A) Turn Report Processing OFF.
- B) Disconnect RS232 cable at Fiber Optic Link in the sensor being calibrated. (Note: Connect the laptop here when required to read sensor values).
- C) Calibrate sensor in accordance with the S-100 Site Technical Manual.
- D) When complete, reconnect the RS232 and turn Report Processing ON. Make a System Log entry identifying which sensor was calibrated. Refer to paragraph 1.3.4.38, page I-72.2, of S-100 ASOS Site Technical Manual for Syslog reporting.

3. Charging the Paroscientific Pressure Standard

The portable Paroscientific pressure standard must be charged on a regular basis. The time between charges is approximately 100 hours and a charge takes between 6 and 8 hours.

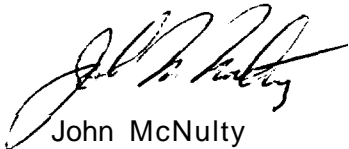
It is recommended that the technician charge the standard once a week. The best way to do this would be to start the charge at the close of business on Friday and allow the standard to charge over the weekend.

EFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

None

A handwritten signature in black ink, appearing to read "John McNulty", is written over the printed name.

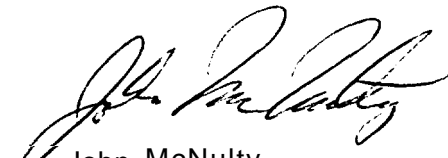
John McNulty
Chief, Engineering Division

AFFECT ON OTHER INSTRUCTIONS

None.

REPORT MAINTENANCE ACTION

Make the appropriate SYSLOG entries. Complete an Engineering Reporting System (EMRS) Form A-26 using instructions in Engineering Handbook No. 4.



John McNulty
Chief, Engineering Division

Appendix 'A'

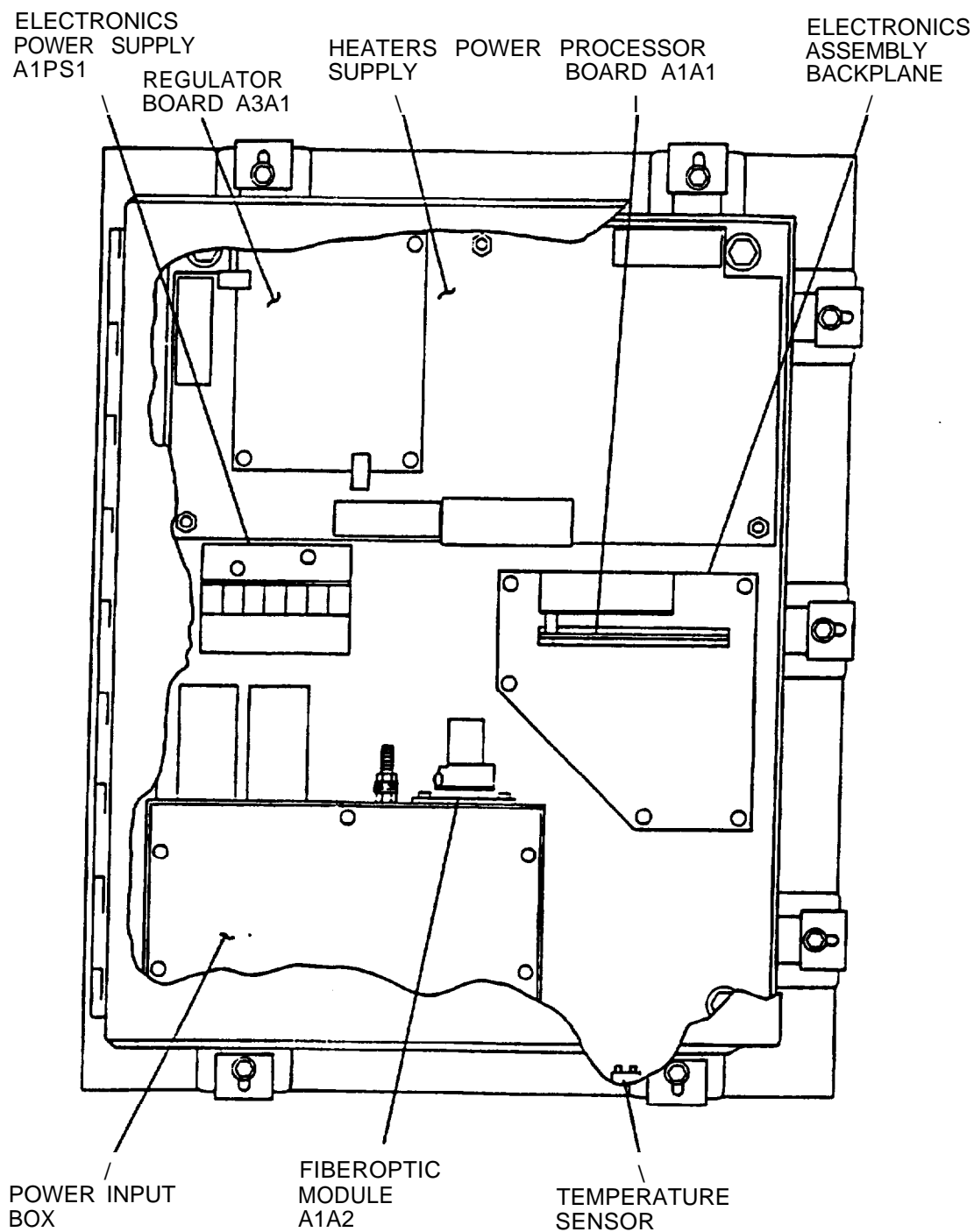
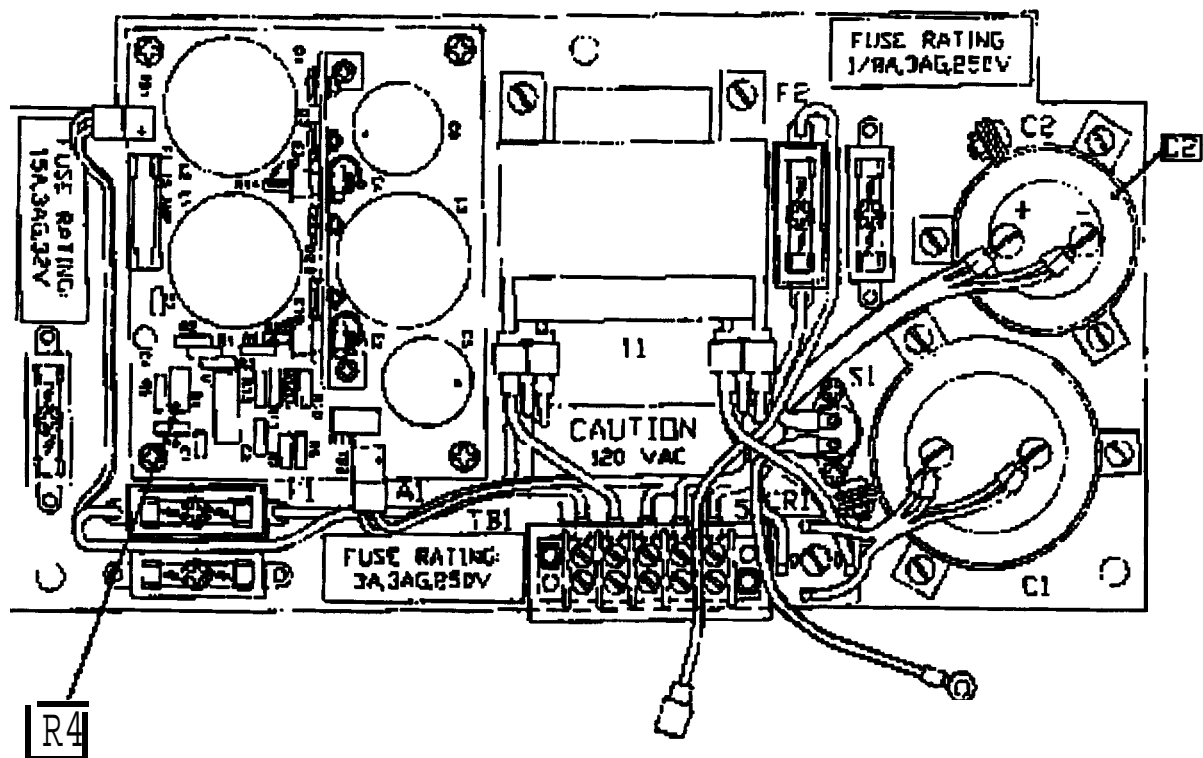
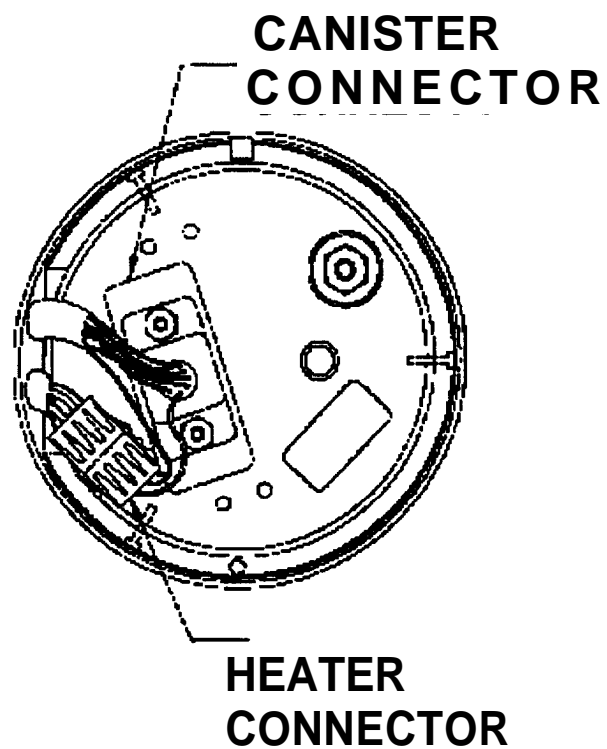


Figure 1 Visibility Sensor Electronics Enclosure



**Heater Power Supply Board
Figure 2**



TRANSMITTER CANISTER END VIEW

Figure 3

ASOS MAINTENANCE NOTE 31 (for Electronics Technicians)
Engineering Division
W/OSO321:AJW

Visibility Sensor Transmitter Optical Detector Functional Check

GENERAL

The visibility sensor transmitter optical detector functional check is accomplished by placing the Belfort field portable light source on the transmitter head and verifying current output of the sensor using a digital multimeter (DMM). This maintenance note provides directions and instructions for test equipment use and establishes the proper current limits of the optical detector in the transmitter canister. Refer to the following instructions to accomplish the maintenance.

PROCEDURE

NOTE: *Before completing this procedure, notify the AOMC, O/C/MIC and any other users.*

Tools Required: Large flat-tipped screwdriver
 Digital multimeter accurate to μA (microamperes)
 Belfort Field Portable Light Source Calibration Unit S100-TE305-2

WARNING

Death or severe injury may result if power is not removed from sensor prior to performing maintenance activities.

1. At the DCP cabinet, set the visibility sensor circuit breaker module to OFF (right) position.
2. Lower the visibility sensor to a horizontal position by removing hinge pin and pivoting the sensor on its mounting hinge.
3. Using the large flat-tipped screwdriver, open the visibility sensor electronics enclosure (Appendix A-1) access door.
4. Remove the protective plug from the end of the Belfort Field Portable Light Source S100 - TE3052. Slide the light source into the visibility sensor TRANSMITTER hood, making sure that the light source is securely against the transmitter window. Orient the light source such that the potentiometer is facing up, and the banana plugs are accessible to the side. Secure the light source by snapping the bungee cord over the perch on the exterior of the TRANSMITTER hood.
5. Remove the cap from the back of the TRANSMITTER hood. Disconnect the DB-9 connector from the rear of the transmitter canister. Remove the trigger coaxial cable from the rear of the transmitter canister (Appendix A-3). Attach the coaxial cable from the light source to the coaxial connector on the rear of the transmitter canister.
6. At the visibility sensor electronics enclosure, locate the +24.0 VDC capacitor, which is the blue capacitor found in the upper right-hand corner of the electronics enclosure. Note that it is the smaller of the two large capacitors (Appendix A-2, C2). Using the long wire set

EHB-11

Issuance 97-01
1-30-97

attached to the light source, attach the wire with the RED alligator clip cover to the positive (+) terminal on the blue +24 VDC capacitor. Attach the alligator clip with the BLACK cover to the minus (-) terminal of the same capacitor.

7. Attach a digital multimeter to the banana plugs on the light source. Set the meter to an appropriate scale to measure a maximum of 50 microamperes DC. The digital multimeter test leads connecting to the light source should be as short as practical.
8. Reapply AC power to the visibility sensor by turning the visibility sensor circuit breaker in the DCP to the ON (left) position.
9. At the Field Portable Light Source unit, depress and hold the push button switch farthest away from the potentiometer adjusting knob. Observe that the digital multimeter shows current flow. Adjust the potentiometer until the current displayed by the multimeter matches the calibration current recorded on the label attached to the light source, ± 5 percent.

NOTE: Because of the small amount of current being measured, the reading may be influenced by RF energy at the site and therefore it may not be possible to obtain a stable reading. If the reading will not remain within the 5 percent tolerance, it may be necessary to shorten the test leads. If RF energy prevents a good measurement, replace the transmitter canister with a tested spare canister.

10. With the first switch depressed, depress and hold the second switch (nearest to the potentiometer). Record the current measured on the multimeter. If the current measured is greater than 7.0 microamperes, the transmitter canister must be replaced.

Canister replacement instructions are in Table 6.5.8 "Transmitter Assembly Removal and Installation" in the Site Technical Manual.

11. Remove AC power from the visibility sensor by turning the visibility sensor circuit breaker in the DCP to the OFF (right) position.
12. Remove the light source and associated cables. Reconnect the DB-9 connector to the rear of the transmitter canister. Reattach the trigger coaxial cable to the rear of the transmitter canister.
13. Install transmitter assembly cap and latch both fasteners.
14. Using the large flat-tipped screwdriver, close the visibility sensor electronics enclosure access door and secure.
15. Raise the visibility sensor and install hinge pin.
16. At the DCP, turn the visibility sensor circuit breaker to the ON (left) position.

Safety Chain for an ASOS Hinged Sensor

General:

The purpose of this maintenance note is to provide instructions to ASOS maintenance personnel on the use of a safety chain when doing maintenance on ASOS hinged sensors. A safety chain will be used when maintenance is being performed to prevent injury in the event the lanyard cable breaks.

Procedure:

The technician should purchase locally one piece of 1/4 inch vinyl coated steel chain, approximately 6 feet in length, and two master quick links (screw type) that are 5/16 inches with a working load limit of 1,760 Lbs.

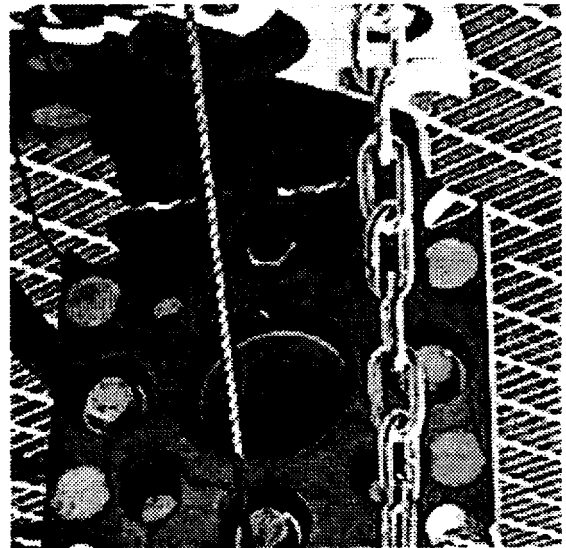
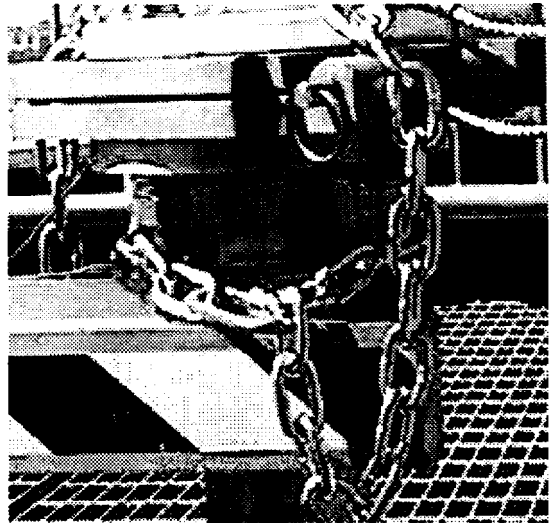
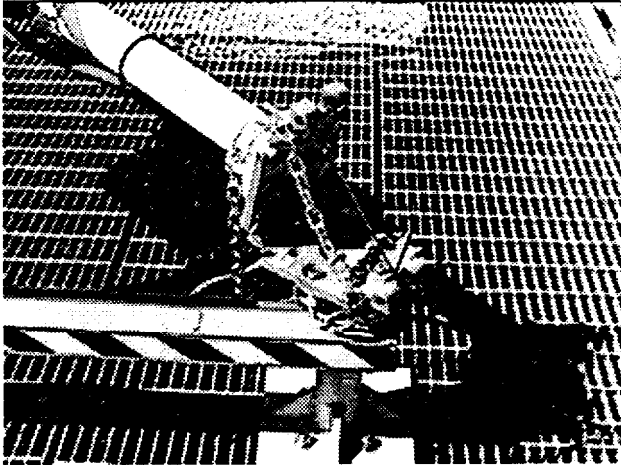
Before an ASOS hinged sensor is lowered to the horizontal position, the technician should wrap the chain around the bottom of the sensor mounting pole and secure the chain using one 5/16 inch master link. The master link should be inserted on the end link of the chain. The wrap should start at the bottom part of the pole below the hinge. The chain is then to be wrapped around the sensor pole above the hinge and secured with the remaining master link. Ensure that the chain is centered over the hinge close to the lanyard. Then make sure that enough slack is left in the chain (approximately nine to ten links) so that the mounting pole may be lowered to the horizontal position. Reference the photos on page 2 for a visual connection. After the chain is connected at each end, the sensor is ready to be carefully lowered into the horizontal position for maintenance. After returning the ASOS hinged sensor to the vertical position, remove the chain and store.

Effect on Other Instructions:

None



John McNulty
Chief, Engineering Division



EHB-11
Issuance 97-05
5/8/97